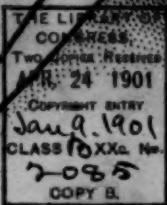


"Uncle Jethro's Will." (Automobile Story) By Joe Lincoln.

Price

25 Cents



THE AUTOMOBILE MAGAZINE

MAY, 1901



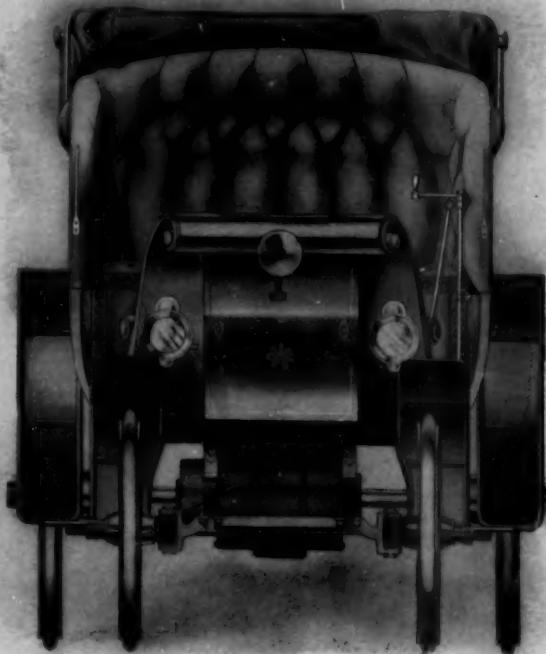
"Through the Sahara"

95 LIBERTY ST., NEW YORK, U.S.A.

VOLUME III

NUMBER 5

Clinton E. Woods Automobiles



are what you have been waiting for if you have been waiting for improvements that should result from a long experience and for a vehicle that looks its name. No more criticisms about having lost the horse! Not an exposed moving or running part of any kind. Every constructional feature of these AUTOMOBILES is simplified, strengthened and designed to meet what experience has shown is demanded to make an electric Automobile successful in every sense of the word. TWENTY PER CENT. LESS current consumption than any other electric Automobile made in the world and GUARANTEED to operate safely and surely up or down a TWENTY PER CENT. GRADE. Provided with a frictionless ELECTRIC BRAKE for hill coasting, and also provided with two mechanically applied brakes for emergencies. FORTY MILES guaranteed on one charge of the batteries. Every constructional feature guaranteed in every particular and the PRICE is REDUCED. Before purchasing an Automobile it is well to consider the many improvements in the CLINTON E. WOODS AUTOMOBILES.

ADDRESS ALL COMMUNICATIONS TO

Woods, Waring & Co.,

Steinway Hall, 17-21 Van Buren St., Chicago, Ill., U. S. A.

Agents Wanted Everywhere.



Natives Washing at Laghouat
Bad Roads
Through the Sahara on Automobiles. See page 442

In the Desert

Laghouat

THE AUTOMOBILE MAGAZINE

VOL. III

MAY, 1901

No. 5

The Lights and Shades of Motoring, or Reminiscences of the Thousand-Mile Trial

By MRS. M. E. KENNARD

PART II

On Friday, May 4, a long day of 121 miles was down on the official programme. The fifty odd cars that represented the survival of the fittest left punctually at 7 o'clock. But what a day! It seemed as if Boreas were determined to detain us captive in the Northern land. He howled, blustered, slapped and buffeted us, as if bent on barring our progress. Hats flew, showers of dust mixed with sharp pebbles were flung into our faces, rendering driving a most arduous task. The pebbles cut like knives. We settled our caps grimly on our heads, pulled up coat collars, and did our utmost to hurl defiance back in the teeth of that horrid old fellow, Boreas. He wrestled and fought with us in Trojan-like fashion throughout the day, and it was some small comfort to think we had managed to best him. Between Haddington, Dunbar and Cockburnpath, he was in his most vicious mood. Then his fury abated for a while, until it sprang forth again at the exposed headland preceding Berwick-on-Tweed. Although unable to conquer the motor-cars, Boreas delayed them considerably. As drivers, we all owed him a grudge for his ill manners. Individually, trouble beset us from the outset. We had happy days, but this was not destined to be one of them. Our De Dion would rush along splendidly for a couple of miles, then she took to missing fire badly, and finally came to an obstinate standstill. On restarting, she went with all her old dash for a short distance, but quickly resumed her

bewildering and disconcerting tactics. We tried everything—battery, terminals, connections, trembler. Where could the fault lie? Suddenly, I remembered seeing a bit of dirt float into the petrol tank while filling up. How about the supply pipe? Should we take it to pieces and investigate its condition? No sooner said than done. And behold, the author of our misfortunes lay revealed. The mouth of the supply pipe was clogged, thus preventing any petrol entering the carburetor. After standing awhile, a few drops managed to force their way through, which accounted for the car's short rushes. The mystery was solved to our no small satisfaction. But alas! mishaps never come singly. We forged ahead and were rapidly overhauling some of our companions, when a suspicious smell of burning greeted our nostrils. Once more we pulled up to ascertain the cause of this fresh trouble. It was but too apparent. The gear wheel pump had ceased working, with the result that our engine was rapidly heating. We bared her to the wind to let her cool, and set to work to detach the pump and, if possible, remedy the evil. But it proved past a road-side repair. The cogs of the wheel were completely worn away. How enviously we looked upon the stream of cars hitherto in our rear, but which now passed us in rapid succession. At length the disagreeable conviction stole upon us that we were last, absolutely last in the long procession. Nevertheless, we did not despair. We carefully re-examined the interior economy of the pump, but without deriving consolation from the scrutiny. We next put it together again, screwed it in its place, inserted a new pin and made a fresh start. All too soon our noses gave warning that that blessed pump was suffering from a fit of inactivity. The situation was vexatious to say the least of it. Slowly, very slowly, with repeated stoppages by the way, we succeeded in accomplishing ninety miles and got to Alnwick. It was now past 6 o'clock, and we agreed it would be very unwise to push on to Newcastle in the circumstances. We therefore bowed meek heads to the Inevitable. We are wont to talk disrespectfully of the Inevitable, but really what a lot of trouble it saves us. The Inevitable decreed we should stay the night at Alnwick and relieved us from all throes of indecision. We simply obeyed its mandates like children. We at once went in search of a competent cycle repairer and asked him to turn us a new cog wheel for the pump, made of gun metal. And although he could not do it himself, he said he knew somebody capable of undertaking the job, and that answered our purpose equally well. He promised us we should have it early on the

morrow, and so, after an exceedingly harrassing day, we betook ourselves to a humble hostelry and chewed the bitter cud of motor shadows in ignominious depression. But by the next morning sleep had put them all to flight. The shades had departed and we basked triumphant in the sunshine of Hope. We refitted the pump, watered and lubricated the car, and were enabled to start for Newcastle by 10:30. And, as if to make amends, the De Dion went like a bird, flying uphill and down, stopping at nothing.

We blessed her then, even as we had cursed her at eventide, and blamed ourselves for the harsh judgments we had previously passed



Fig. 4. The Practical Side of Automobiling

upon her. Dear little De Dion ! Thou wert restored to favor. But one point impressed itself strongly on our minds in connection with this celebrated tour. Engines have seldom failed their owners. They have played their part right bravely and inspired universal confidence. But where manufacturers should turn their attention towards improvement is in the direction of tires, pumps, gear, transmission, brakes and accessories. Both on the Critchley, Daimler and the De Dion, the pump proved the cause of trouble. In the one case it was friction driven, in the other gear driven. Neither was satisfactory and in the event of failure some means should be devised by which water could

be brought to the engine. It is in the details of a motor car, rather than in its general construction, where for the present exists the greatest scope for advance. Springs, axles, brakes, efficient transmission, reliable pumps, trustworthy steering, improved methods of ignition, and smaller consumption of petrol are all points worthy of the closest consideration. Tires, too, leave much to be desired, and to render the horseless vehicle an article of real utility the puncture fiend must be abolished and with it its brother spectre, side-slip. These and many similar lessons were taught by the Thousand-mile Trial. That the tour has given an immense impetus to the industry is undoubtedly. Intelligent manufacturers have since done their utmost to correct weaknesses which have manifested themselves. It was gratifying to find that the 8 horse-power Napier—a car of English build throughout—bore herself in the forefront of the fray, and succumbed only to the superior horse power brought against her by the 12 horse-power of the Honorable C. S. Rolls. The experts pronounced unanimously in her favor, and she proved herself one of the big successes of the tour. Buyers need no longer go to France. A move has been made in the right direction.

Sunday, May 6, proved a trying day to the ardent autocarist. It pelted religiously with rain, and as the Exhibition was closed, the solace of inspection was denied him. The next morning broke dull and wet, and the roads were in a fearful state of black, greasy mud. The conditions were unfavorable in the extreme and when we started for Leeds at the usual matutinal hour of 7 a.m. the cars waltzed around in the most unpleasant fashion. During the earlier portion of the day steady steering and slow going were imperative. Luckily, matters improved somewhat after Darlington was passed, and most of the cars reached Northallerton in fairly good time. Our De Dion was now behaving magnificently and running up to her very best form, when we perceived the noble Napier brought to a standstill by a badly-punctured back tire. Her small attendant—*young Cusins*—a most promising motorist aged fourteen, had failed to notice the casualty when first it took place. Consequently the inner tube was hopelessly nipped. A new one was substituted, and in spite of a delay of three quarters of an hour, the Napier reached Leeds at 4:17, running a dead heat with Mr. Holder's 12 horse-power Daimler. The first arrival was Mr. Rolls at 3:45, followed at 4 by the Ariel tricycle with Whippet trailer. Previous to this, we stayed over an hour at York, where the cars were on show in the beautiful gardens of the principal

hotel. A very large concourse of well-dressed gentlemen and ladies assembled to see them. The afternoon turned out fine and the fair town looked its fairest in the sunshine, with its stately Cathedral towering as a landmark over the gray, old city walls and smoothly-flowing river. In spite of such bad roads at the start, the day's run was highly successful, and nearly all the cars arrived at their destination between 6 and 7 p.m. No fewer than forty-nine put in an appearance at Leeds. This must be considered an excellent result, considering the many hundred miles already traversed. To quote a pressman, who accompanied us throughout, "I mount a motor car with the same degree of confidence as I would enter a train."



Fig. 5. Raising the Dust

Yorkshire is proverbially the home of the horse. Perhaps, for that reason we encountered more restive animals than on any previous stage of the journey. If horses fear motor cars, motor car drivers heartily reciprocate the sentiment. A nervous creature whose movements cannot be anticipated is the autocarist's worst enemy. Often, he allows the car to approach within a few yards ; then suddenly he wheels round, and either backs right into it or commences to lash out with his hind heels. Both proceedings are equally disagreeable, but of course, it is always the car that is blamed.

On Tuesday, May 8, the good people of Leeds were afforded an

opportunity of viewing the travel-stained equipages in the Drill Hall—a chance of which they availed themselves freely. The hall, however, was small and failed to display the cars to full advantage. Owing to want of space, they were crowded together. We were getting tired of exhibitions.

Wednesday, the 9th, the weather was distinctly unfavorable. Heavy rain during the night and early morning left the roads in a most unpromising state for pneumatic tires. Greasy mud lay inches thick in depth, a high wind blew straight in our teeth, and it was cold as winter. Nevertheless, the cars left Leeds punctually at the customary hour, their departure being witnessed by comparatively few people, the elements doubtless keeping them at home. Those who undertook the Thousand-mile Tour had made up their minds from the first that it would not be all child's play, and on the present occasion the veterans displayed commendable fortitude. Nobody grumbled, surprising to relate. One and all were determined to endure to the bitter end. Although the slippery roads were attacked with extreme caution, they utterly failed to bar the onward progress of the expedition. Side-slips were numerous, and several of the cars had narrow escapes, but fortunately no serious accidents took place. The entry to Harrogate was heralded by an unusually steep hill. Many of the inhabitants had congregated here, in order to witness the various vehicles attempt the ascent. The majority got through the ordeal triumphantly, but a small percentage shed their passengers, while one or two even had recourse to manual assistance, so steep was the gradient. From Harrogate on to Bradford there were hills enough to satisfy the veriest glutton, and what with the heaviness of the roads, their treacherous surface and a strong head wind, the cars were put to a severe test. Owing to a combination of natural and climatic conditions, the whole journey to Sheffield was a peculiarly hard one. Once more the self-propelled vehicles displayed their reliability and hill-climbing powers. The big manufacturing towns through which we were passing were not interesting from the driver's point of view, and we came to the conclusion that this day was the least enjoyable of any we had hitherto spent. We had left the fair open country, and it was replaced by a never-ending series of straggling villages paved with the vilest of cobbles, and ornamented by the tallest and dirtiest of chimneys. Round Sheffield itself hung a pall of heavy gray smoke, which rendered the approach to the City of Cutlers anything but attractive. The Drill Hall made handsome atonement, however, when it opened

its hospitable and spacious doors to the mud-bespattered cars, and housed them safely for the night in the vast building which they guarded. They—the cars—needed no encomium from their owners. Their presence spoke for itself. The weakly had long ago been weeded out, and none but the stoutest and best remained. Their weather-worn appearance testified to deeds of "derring do." This was no dilettante motoring, but motoring in dead earnest.

A rest on Thursday, the 10th, was acceptable for once, and we tolerated the Exhibition with a better grace than usual. Save for the intense cold, the following day was a most enjoyable one. We left Sheffield with few regrets and gradually emerged into a purer atmosphere.

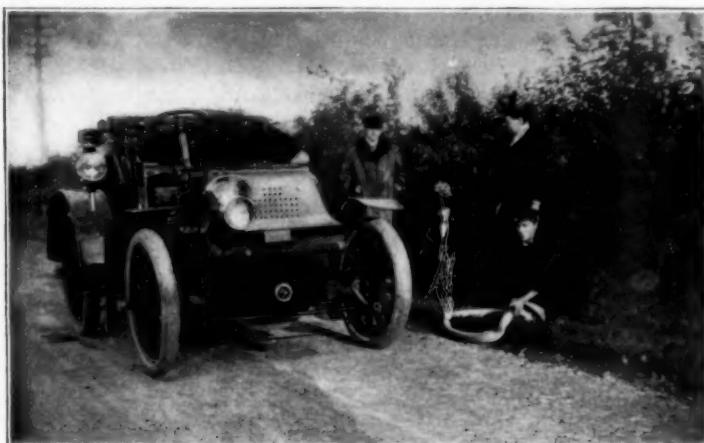


Fig. 6. Tire Trouble

The roads were dry and in excellent order, and the cars wended their joyous way through the stately parks of the Dukes of Newcastle and Portland. Sunshine was requisite to do full justice to their beauties, and this unfortunately was lacking. Phœbus declined to show his face. At Welbeck, a mile speed race with flying start had been organized. To reach the chosen spot necessitated a wide detour of some eight and twenty miles. A large proportion of the cars preferred to go straight on to Lincoln, but personally, we desired to see the fun, and, our De Dion continuing in a good mood, did not mind the extra distance. So we accompanied the racers. The drive through

Welbeck Park alone repaid us for our enterprise. Beautiful were the trees, the sylvan glades, the stately stags and far-reaching vistas of shadowy avenues. It only wanted sunlight to give warmth and color to the scene. Arrived at our destination, each entered car started a few seconds after the leader. It was a sight to see Mr. Rolls come tearing along on his Panhard at the rate of an express train, sitting crouched over the steering wheel, yet guiding it with unerring skill. The Napier followed next, then a Daimler and numerous lesser lights, their time being accurately taken. Nothing could be more exhilarating. The spectacle possessed all the fascination of horse racing. The proceedings over, we made haste to rejoin our companions at Lincoln, where the Mayor most kindly entertained us to a sumptuous luncheon. Never did a meal prove more welcome. The road on to Newark and Nottingham was in grand order, and the cars fairly flew along their level surface. Only one drawback existed to our enjoyment in the shape of the positively Arctic temperature. To keep warm was an impossibility.

The last day of the Tour, Saturday, May 12, we hardly knew whether to be glad or sorry. Many of us were very weary, for long days and short nights began to tell after three weeks of travel. And of late, the weather had been anything but kind. Pluvius apparently determined to take farewell of the expedition, and once more the roads were reduced to a sea of mud. The going was very disagreeable, not to say dangerous, and the Leicester tramlines were negotiated with excessive caution. At Northampton, Mr. Mulliner liberally entertained the company to lunch, and the inner man thus fortified, the drivers remounted into their seats. And so, the long procession wound its way through Newport, Pagnell, Dunstable and St. Albans. To several of the small, low-powered cars this proved a toilsome journey, but all stuck to their task, until at length London was gained. So ended the great event, rendered a trifle less brilliant, a thought more sober towards the finish, by inclement atmospheric conditions, but with the autocarist's enthusiasm glowing as keenly as ever. The general opinion was that the cars had covered themselves with glory and earned a right no longer to be regarded as the rich man's toy or fad. They had demonstrated their reliability and entirely eclipsed the staying powers of their equine opponents. As previously stated, the English-made Napier gained golden opinions, although Mr. Roll's Panhard proved the flier of the party. Throughout the tour, the Daimlers went steadily and well. The same remark applied to the

Benz division, which, if not conspicuous for speed, seldom failed their owners in an emergency. Of the small cars, nothing went better than the Wolseley, the De Dion, the Gladiator and Triumph. That so many of the voiturettes should have come through such a crucial ordeal was a great surprise, and intending purchasers need no longer stand aloof after the Thousand-mile Trial. Everywhere, the people saw with their own eyes what autocars can do. The simple country folk marvelled at their swiftness, their tractability and convenience, and were astonished at their hill-climbing powers. Prejudice has been overcome to a certain extent, old-fashioned conservatism broken down, pre-conceived notions modified. All this was highly gratifying. When the autocarists repaired to their respective homes, they had the pleasing consciousness strong upon them that they had not endured the dust and the dirt, the heat and the cold, the wind and the rain in vain. As pioneers of an enjoyable and useful movement, they deserved well of succeeding generations.



An Object Lesson in Stopping

ONE of our friends who isn't noted for being especially careful of a machine, was speeding along the other day when he was held up by two blue coated guardians of the law.

"It's goin' too fast ye are," says one.

"Kape her down ter ate miles er we'll run yer in," said the second.

"But my friends, I wasn't running fast at all—and then you know we have great control of these machines, too. Why, we can stop in our own length."

"Gwan wid yes—yer can't pull de wool over our eyes dat way, see?"

"Well, I'll tell you what. Just climb up behind here—both of you—and I'll show you how."

After much persuading this was accomplished and they started down the road at a lively rate. Suddenly and without warning the operator reversed the engine and threw on both brakes. It was like hitting a stone wall and the air seemed filled with blue cloth and policemen.

"Didn't I tell you I could stop her quick."

"Bedad yer did, and if 'twasn't fer phat the sargent wud ask me phat I was be doin' in the automobily I'd run ye in. Yer can stop all roight, but the landin' av yer passengers is more suddint than illigant. If I get a chance ter run yer in for spheding I'll do it--so kape yer eyes peeled."

The stopping quality is a great point for safety—both of riders and pedestrians—but it is hard on a carriage to submit it to any such strain unnecessarily.

Our English neighbors who are owners of automobiles seem to be having a hard time in the police courts over there. The number of court cases in which automobilists are mixed up seems to be on the increase. Most of the proceedings are instituted on the grounds of furious driving. There can be no doubt that the attempt to run at high speeds is too common among automobilists, but it is very doubtful if the interests of the automobile will be furthered by this kind of thing.

A New Petroleum Motor

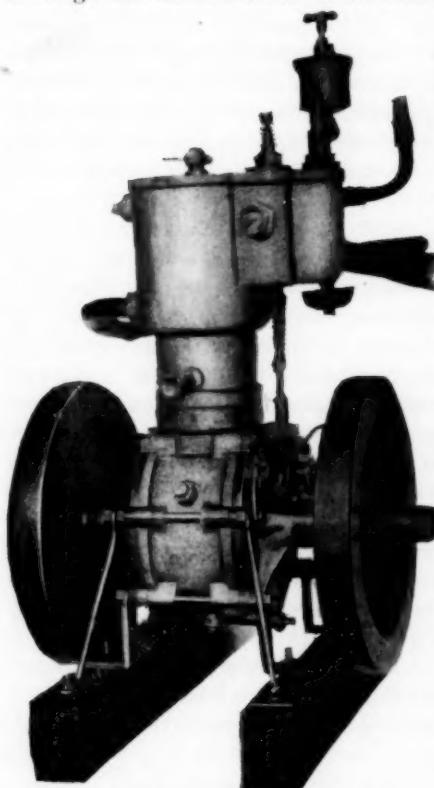
THE accompanying illustration is that of a new petroleum motor, designed by Mr. Henry Sutton, of Melbourne, Australia. It is of course well known that for years men have been trying to design and build a motor which would use petroleum satisfactorily

instead of gasoline. The petroleum motor does possess certain advantages over the gasoline motor and in America especially where petroleum is so cheap, such type of motor would find many friends.

The engine shown gives about 6-brake horse-power when making 640 revolutions per minute. The bore is $4\frac{1}{2}$ inches, while the stroke is 6 inches. The particular feature of interest about this engine, however, is the fact that it uses 150° flash test heavy oil. The inventor claims that it starts from the cold within one minute. There is no visible exhaust, either when starting or during operation, and furthermore the claim is made that the combustion is so perfect as to cause no odor.

If this engine does what its inventor says it will there

ought to be little trouble disposing of a large number of them. However, Mr. Sutton's researches along these lines are valuable, and if he has not solved the problem connected with the building of a satisfactory petroleum motor he has gotten very near to it. Let us hope he has. We are indebted to the *Autocar* for the accompanying illustration and particulars.



Sutton Kerosene Engine

A Hill Climbing Experience

By FRANK W. BOLANDE

A PERSON has never run the full gamut of a season's automobile experiences until he sees his machine pitch headlong down a hill backwards. If he is aboard the vehicle it is probable that he is subject for the attentions of the wrecking crew from some hospital. If by good fortune he has jumped in time then his reflections, as he watches his beloved automobile tear itself to pieces among rocks and trees, can be imagined.

One gentle day last August I came upon the peaceful town of Chester, Mass. I had automobiled from Bridgeport and was on the way to Lenox. Everything had gone splendidly so far. The roads had been good, bad and indifferent; some of the stretches of State roads in Massachusetts and Connecticut being particularly good and the intervening stretches being particularly bad. From Springfield that day the ride had been very enjoyable, especially over the hard macadam roads that led to Fairfield, Mass. The carriage was behaving beautifully, and it was with no thought of trouble that my wife and I bowled into Chester and were served with a coal scuttleful of gasoline at the principal village store.

At this town we heard with some little trepidation of the Middlefield hill, which, it was said by the villagers, had taken the measure of more than one automobile that season. It was three miles long and a series of steep rises. There seemed to be no way to avoid it, and accordingly we set out. Two and one-half miles from Chester we began the ascent, being sure that we had a full boiler of water. A few rises were taken all right and I was confident that we should arrive at the summit all right.

At times the road was in such a position that we could look directly upon the top of a passing train which circled the foot of the hill. When taking another rise, I noticed that the machine began to waver. I looked at the steam gage and saw that it indicated 140 pounds of steam. I had no fear then but what we would go up in safety. But she hesitated, and when it was apparent that she would not go up, my wife and I, without saying a word, but by a sort of common instinct, both jumped. Our intention was to take hold of

the wheels and keep the machine there. I supposed that this would be an easy matter, as relieved of our weight it was my impression that the carriage would make the rise easily. What was our surprise to see the machine gather velocity and wrench itself loose from our hands. It ran at full speed backwards and leaping the two-foot stone wall at the side of the road plunged down the side of the hill into the trees and underbrush.

About twenty feet down it caught in some trees. It was almost upside down and the wheels were buzzing terrifically. At first I stood still and whistled. My first impression was to walk away and leave it to its fate, thankful that we were not at the bottom of the hill with broken limbs or worse. I thought it would explode and burn up and did not care to take further chances. I had not gone far, however, when better sense prevailed and I returned, crawled down to the machine and turned off the gasoline supply, putting out the fire and stopping the engine. I then noticed that the reverse lever was on a dead center, and it was evident to me that in some manner the lever had worked back and prevented the full power of the engine being exercised. The jar made by jumping from the carriage had probably thrown the reverse further back and caused the machine to go backwards at good speed.

We waited until a farmer came along and he kindly agreed to carry us back to Chester. The only two-horse team available was working on the road for the town. By seeing the selectman I was able to get the team and three men. Armed with axes and ropes we went back to where the machine lay on its side. By dint of cutting away some of the underbrush we were able to haul the automobile out onto the road further down the hill.

One axle and the wheels were badly sprung, the rear end of the body was smashed and the boiler was burned out. I sent it back to the factory and in a week it was as good as new. I am careful now to see that the reverse lever is good and tight. Besides, I have an improved lever and a brake that holds backwards as well as forwards.

Manager of a Dime Museum: "Say! One er you ducks run down ter the automobile store and git a tire repainer; some Smart Aleck's punctured the boer constrictor with his cane!"

The Chicago Show

THE first automobile show held in Chicago, extending from March 23 to 30, was handicapped both by the weather and the fact that so many shows had preceded it within a few months. In spite of this there was a fair attendance of both exhibitors and visitors and the *Motor Age* deserves credit for carrying it through in the face of many difficulties.

They had a novelty in the shape of a racing stand or machine, after the manner of the old "home trainer" of bicycle days. This consisted of wide-faced pulleys on which a carriage was mounted, and a dial arrangement run by belting showed the parts of a mile. Two hands were used—one for each machine so that the relative speed of two contestants could be watched. Miles were made in fifty-seven seconds on this and it obviated all the dangers of racing on a small track.

The flower parade on the night of the 28th was very attractive, first prize being won by Mr. Shaw in a Mobile dos-a-dos. Mr. Cook in a Reading carriage also received much applause as well as the second prize. Some of the *Motor Age* employés rigged up a canopy and a cow bell on a wheelbarrow and called it a Push-a-mobile.

Some of the exhibitors report satisfactory sales as a result of their exhibits and their efforts, all of which must be very gratifying to the managers of the show.

Mr. Wridgway of the De Dion-Bouton Motorette Company was very much in evidence assisting their Chicago representative show the merits of these machines. Mr. Knox and his three-wheel runabouts attracted considerable attention and those who rode in the machines were highly pleased with the smoothness of operation and the convenience of the carriage.

Both Mr. Starkweather and Mr. Donsman were kept busy explaining and demonstrating the Milwaukee machines—both as to operation of the machines and such details as the burner and engine construction. They exhibited a racing machine, an express wagon and a five-ton truck in addition to their surrey and runabouts.

The Woods Motor Vehicle Company had one of the largest exhibits and one that was exceedingly attractive.

The National Automobile and Electric carriages were liberally patronized and ran very smoothly.

The Mobile Company and the Steam Vehicle Company of America both created a good impression in many ways.

Among the other exhibitors were the E. R. Thomas Motor Company (motor bicycles), Touring Manufacturing Company (electric runabouts), Shelby Steel Tube Company, Hewitt-Lindstrom Motor Vehicle Company, O. V. Bochelle (electric runabouts), Kelly Handlebar Company (lighters for gasoline burners), American Roller Bearing Company, Munger Vehicle Tire Company, Moffett Vehicle Bearing Company, Porter Storage Battery Company, Badger Brass Company (lamps) and Veeder Manufacturing Company (odometers).

Liverpool Trials of 1901

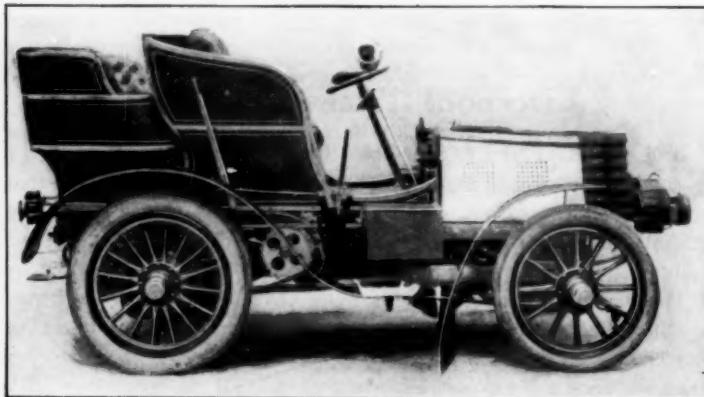
MR. SHRAPNELL SMITH, the energetic secretary of the Liverpool Self-Propelled Traffic Association informs us that the entry forms for these trials are now ready for issue to intending competitors, and any of our readers who may be interested can obtain full particulars from the gentleman named.

The Council, upon representations that a number of vehicles will otherwise be debarred from competing, have decided to add a fourth class. In this new class, to be known as Class D, there are no restrictions upon the tare or platform area, and all the conditions published on June 13, 1900, apply. The minimum load to be carried is 4 tons, but an excess may be declared as by Rule I. There are no alterations in Classes A, B and C, the specifications for which remain unchanged.

Below are given particulars of this competition. The program of trials is as follows: Monday, June 3, hill climbing contest. Tuesday, June 4, run from Liverpool to Manchester. June 5, Manchester to Liverpool. June 6, Liverpool to Blackburn. A detailed account of these trials was given in our February number, and we can only again express the hope that America will be well represented.

A 24 Horse-Power Napier Car

A STYLE of vehicle which is growing more and more popular in Europe as well as in America is that shown in the accompanying half-tone. The car shown is now being constructed for Mr. Charles J. Glidden, of Brookline, Mass., and will have four cylinders, giving 24 brake horse-power. As will be seen by the illustra-



Chas. J. Glidden's 24 Horse-Power Napier Car

tion, there is great strength and power in this automobile. It is capable of carrying five passengers, having the favorite tonneau body.

The maximum speed is about 40 miles per hour, and sufficient gasoline can be carried to run for 200 miles. The front wheels are 33 inches in diameter, while the rear ones are 36 inches. The pneumatic tires on the front wheels are about $3\frac{1}{2}$ inches diameter, while the rear tires are $4\frac{1}{2}$ inches. The frame is of channel steel, and Mossberg anti-friction roller bearings are used throughout.

Mr. Glidden expects this new car will be finished about July 1. The gentleman named is a member of the Automobile Club of Great

Britain and Ireland, the Automobile Club of America and the New England Automobile Club.

The car certainly is a strongly built and reliable vehicle, and its performances after it reaches these shores will be watched by our leading automobilists.

Storage of Gasoline

THE proper storing and handling of gasoline is a question which is at times a vexing one, especially in the case of private owners. The letters which follow, being written by gentlemen who have had much to do with the storing and care of gasoline, will, we feel sure, be read with much interest.

Never having had any sort of an accident with the gasoline I have carried I cannot from experience say what *not* to do.

To avoid accident I should say that the individual operating a carriage in which gasoline is used should buy his gasoline in the five-gallon, air-tight cans sold by the Standard Oil Company. These cans come two in a wooden case which prevents their being injured in transit. By using gasoline from such cans the gasoline will be found to have its original strength when opened, and as most carriages have a storage capacity of more than five gallons the can may be entirely emptied when opened, avoiding the carrying of open vessels containing gasoline and so the accumulation of gas in the room or house used for storage ; which, by the way, should be separated from all other buildings, and should never be allowed to accumulate empty cans or barrels or rubbish of any sort.

This room should have ventilation around the *bottom*, as gasoline gas is heavier than air and it would so have an opportunity to escape.

I think that the ruling of the fire underwriters that all gasoline storage houses should be ventilated from the top is a poor one.

The gasoline should not be poured in a closed room in which there may be open lights.

I think that all patent cans and arrangements are usually made to make a profit for the manufacturer and are apt to leak and so become dangerous on account of their poor construction and open parts. Understanding that gasoline gas when confined is explosive, I believe

that the automobilist will generally prefer to pour his gasoline in the open air and so avoid any possibility of accident.

Yours very truly, PERCY OWEN,
NEW YORK, N. Y. Eastern Mgr. Winton Motor Carriage Co.

The storage and handling of gasoline is one of those things of which the public have not correct ideas, and as the unknown is always feared more than the known, so the imaginary dangers of gasoline are feared more than the real ones. It is a common idea that gasoline is explosive, but this is not true. It is quite inflammable, and if this one fact be kept in mind and caution exercised accordingly, no danger exists. The fluid should be kept in tight cans so as to prevent loss from evaporation and danger of fire from the ignition of the vapor. It should further be kept in a well-ventilated place so that any vapor may be swept away by the current of air. When handled no fire or lamps should be near it, and it should be kept in mind that at all times the vapor is heavier than air and settles to the ground, so that a flame near the ground is much more dangerous and liable to ignite the vapor than one placed above it. If gasoline vapor is allowed to mix with the air of a room in proper proportion, the mixture is explosive and very dangerous, but the same fact is true of ordinary illuminating gas and accidents do not frequently occur from that cause. The public have grown so accustomed, however, to the use of illuminating gas that they no longer think of it as dangerous, when as a matter of fact it is extremely so.

Gasoline as a liquid cannot be exploded. It may be poured out of an ordinary can while burning with safety from explosion; and dropping a match into a receptacle results only in setting fire to the slight amount of vapor escaping from the opening. The same test applied to a kerosene can would likely burst the can. The reason is that the gasoline vapor is too rich to explode; while the kerosene, evaporating much more slowly, may form with the air in the can an explosive mixture. The fires in connection with the use of gasoline commonly termed "explosions" by the ordinary newspaper reporter are simply cases where gasoline vapor is ignited from some source of fire, and have not been explosions proper. Knowing these facts we store our gasoline in an outbuilding as required by the insurance laws and handle it in cans open only at the top. If by accident any gasoline on the outside of said can caught fire it would simply burn off and unless the can became sufficiently heated to boil the gasoline contained

therein no fire other than a small flame at the mouth would result, whereas if the can had a spigot at the bottom, which leaked to any amount, the fire would continue to burn at the leak and probably cause trouble.

We make our tanks as nearly seamless as possible and flange, rivet and solder the necessary seams, which arrangement secures a safe reservoir on our vehicle. We further place this reservoir at the lowest point of the vehicle so that any leakage will drop to the ground and not be liable to take fire from the muffler or motor. As a result, we have never had, in our ten years' experience, anything that could be called an explosion and only one fire, which was due to the overturning of a partly finished vehicle not having a stopper in the gasoline tank. This allowed the liquid to spill into the motor and catch fire, a result which would likely happen if a kerosene lamp were overturned. When it is remembered that we have men of all degrees of carelessness handling this liquid, it will be seen that the record is a good one. We have had leaky tanks, overturned vehicles and many odd experiences during the period mentioned, but having no pressure in our tanks a leak is generally observed before it becomes very large, and having no open fire it is almost impossible to get a flame from the motor to the gasoline.

We further provide the filling aperture with safety gauze, so that looking into the tank with a lighted match to see how much gasoline there is, as is sometimes done (see *Autocar*, March 16, 1901, page 248), is not necessarily dangerous. We are confident that with our arrangement and with remembrance that gasoline is quite inflammable, the handling and use of a gasoline vehicle is as free from danger as any vehicle can be.

DURYEA POWER COMPANY,

C. E. DURYEA, Vice-President.

READING, PA.

It has been said that "a little knowledge is a dangerous thing." Perhaps this can be aptly applied to the common understanding of the handling and storage of the volatile product of petroleum known in the United States as gasoline and in England and on the Continent as motor spirits or petrol.

The question of storage of gasoline, since the introduction and general use of automobiles, has been one toward which no small amount of attention has been directed, and is one which those using gasoline should fully understand. The dangers attending the

use of gasoline have been almost always exaggerated by the press and insurance companies, yet the subject of storage and the handling of it in quantities for the accommodation of users of automobiles is one which should receive careful and intelligent attention. If properly stored and handled, gasoline is as harmless as water. Insurance companies demand that where gasoline is kept in quantity it be stored in some place with low temperature.

An accident occurred not long ago on one of our streets quite startling in its effects. Some workmen left a bright tin can filled with gasoline standing on the sidewalk during a hot day in July with the sun's rays pouring down on it. The contents of the can exploded, with, however, no more serious results than the total absence of the can.

One of the least considered, last thought of, and yet one which should be reckoned among the most dangerous of all the peculiarities of gasoline is the following: The tendency of this gas arising from the fluid during damp or heavy weather to bowl along the floor of a building in vapor form, if any quantity of it be *left exposed*. In the days before gasoline was thought to be of any commercial value it was thrown away in vast quantities as a waste product, and small brooks of gasoline were to be found running into the East River from all the big refineries. An owner of one of these works told me that on damp days he could often see a gray ball of the gasoline vapor, almost invisible, rolling across the meadows. Boys at times would leave a bonfire smoldering on the meadow, and once in a while a ball of this vapor would come in contact with a flame of fire and the result would be a serious conflagration.

In any well regulated automobile storage and repair station you will find only electricity used for furnishing the light and power. Gasoline can be stored in quantity with safety only by having a proper gasoline tank constructed, or simply storing in the barrels in which it is received. This latter method saves about 3 per cent., which is lost if transferred to another receptacle. A faucet can be inserted in the barrel and the fluid drawn as the demand requires. There should also be a cover over this barrel.

In the quiet old city of Philadelphia, ignorance on the part of a would-be chauffeur and two mechanics he had engaged to repair his automobile, resulted in the death of one and serious injury of the other two men. With incredible carelessness, a blow-pipe was used underneath the gasoline tank in mending a leak, with the dreadful results above mentioned.

Practically, all the fires arising from gasoline used in automobiles have been in those vehicles in which gasoline was under pressure and the gas used for fuel to generate steam. We have yet to find a single fire caused by the use of gasoline in any of the ordinary types of well-constructed hydro-carbon or internal combustion motors. In some of the foreign types which employ hot tube ignition there is, of course, a slight element of danger, but in the best class of American-made gasoline carriages there is no danger whatever.

In several of the internal combustion motors the gasoline is fed by gravity, the amount being regulated by a needle valve into the carbureter. The electric cables are heavily insulated, there is no open fire or flame, and no possibility of causing fire or explosion.

Almost all municipalities have particular regulations regarding the care and storage of the volatile products of petroleum, and considering the enormous use of the light petroleum oils, ranging in a thousand industries from the huge city gas works to the humble peanut-roaster on the sidewalk, it can be seen that with any reasonable degree of care, gasoline is a safe and most useful product. When under great pressure and mixed with the correct amount of air, it is, of course, highly explosive—hence its value in the automobile engine.

The principal point to keep in mind in the storage and handling of gasoline is that it should never be brought near to an open flame. Even at a distance of many feet the invisible gas forming may ignite with disastrous results. It should be kept, if possible, in closed metal receptacles, and drawn off in quantities as required. Electric light only should be used for illumination where liquid gasoline is present.

For use in motor vehicles the writer prefers to use the ordinary stove gasoline, put up by the Pratt Works in five or ten gallon tins, as these tins are hermetically sealed and the contents usually correspond with the ordinary vehicle tank; thus at once furnishing a safe and convenient method of storing and handling.

The rapidly increasing use of gasoline in automobiles has caused several forms of specially constructed metal tanks of convenient shape and design to appear on the market. As the public becomes more accustomed to the volatile nature of gasoline, methods of storing and handling will doubtless improve, until the fire risk will be reduced to a minimum.

NEW YORK CITY.

A. WARD CHAMBERLIN.

In regard to the storage of gasoline, there is but one thing to be done and that is to have an hermetically sealed vessel placed outside of your building in some manner. This could be arranged with a pump or a faucet, which has to be opened with a key to prevent interference.

L. B. SMYSER.

JERSEY CITY, N. J.

The New York *World* had two styles of delivery wagons on trial for four months with instructions to give them as hard a test as they could be put to. At the end of that time the "Mobile" Company offered to release the *World* from its contract if it so desired. The statement was made to them: "You know now as much about these wagons as the 'Mobile' Company does. If you take them you must take them entirely at your own risk and without any guarantee of any kind. You are at entire liberty to break the contract if you wish to after this trial." The reply of Mr. Seitz, the business manager of the *World*, was: "How quick can you deliver them? Rush them without a moment's delay."

This company has from the first opened its factory to the public and has offered to pay for any information from experts that would lead to the use of better material or a suggestion for better workmanship. It has said, in the full belief that it was uttering strict truth, that if a purchaser came to the factory and offered \$5,000 for a carriage the company could build no better carriage than that which it ordinarily turns out. A curious demonstration of this was recently made. Mr. Kilpatrick, the one-legged bicycle rider who rides down the stairs, which are hoisted to the top of Madison Square Garden, in the show there, after long investigation recently came to the factory and ordered a "Mobile." The general superintendent, Mr. Haddow, simply gave instructions to go out into the stock room and take out a machine and paint it white. It is needless to say that every possible effort would have been made to render this machine absolutely perfect as the man is to daily risk his life on it, and no pains or expense would have been spared on the part of the "Mobile" Company. The superintendent's action simply confirms the statement which the company has repeatedly put forth.

Among the Clubs

(Secretaries of clubs and chairmen of committees are requested to send in items of news for use in this department.)

BOSTON, MASS.

THE following is part of a letter recently received from the secretary of the Automobile Club of New England, referring to their method of handling gasoline, and to which reference was made in our April number.

I am afraid Mr. Stevens has given the impression in his article that our gasoline tank is quite an elaborate affair, whereas it is really quite simple.

It is merely a tank open at one end, which holds, I think, two gallons, and has a valve at the bottom to allow the gasoline to run out, or to shut it off when a member has enough, and an arrangement so that different size pipes can be attached to the bottom, depending on how large an opening the gasoline tank has which is to be filled. The tank has marks embossed on the side so that the man can tell exactly how much gasoline has run out and charge accordingly. There is, of course, nothing to show when a member has enough, as it is only a question of giving a member all he wants.

At present we store our gasoline in large iron tanks out in a field, but after the frost is all out of the ground, we hope to have an arrangement so that the tanks will be buried in the ground and then by putting on air pressure temporarily force the gasoline out through a flexible pipe until a member receives all he wants, then the air pressure will be taken off. By this arrangement the gasoline will not be kept under pressure. This method was used by the New England Electric Vehicle Transportation Company at Newport last summer quite successfully, I believe.

Yours very truly,

GEO. E. MCQUESTEN, Secretary.

PRINCETON, N. J.

Our club has just been formed and is as yet in its infancy. There are a quite a number of men here who have automobiles, but have not brought them down as yet. Next year we hope to increase our mem-

bership. We hope to have two runs this spring before college closes, one to Asbury Park and the other to Philadelphia. We may extend our second trip to Atlantic City. Yours truly,

CHARLES H. DUGRO,
Secretary Princeton University Automobile Club.

NEW YORK.

The Automobile Club of America has already broken the ice in the matter of Spring and Summer runs, the initial one taking place March 30, the objective point being Westchester Country Club. About eighteen carriages took part, and the event was enjoyed by all present. Other runs are scheduled as follows: April 27, Babylon, L. I.; May 11, Hopatcong; May 18, Morris Park (if satisfactory arrangements can be made); May 25, New Haven, Conn.; June 8, Tuxedo, N. Y. The annual dinner of the club was held on the evening of Thursday, April 18, in the Waldorf-Astoria Hotel.

ROCHESTER, N. Y.

The first Spring meeting of the Rochester Automobile Club was held April 8, at the club rooms, Hotel Livingston, that city. Frederick Sager, Secretary.

AUTOMOBILE CLUB OF NEW JERSEY.

The Contest and Runs Committee of the Automobile Club of New Jersey, held the following runs during April: April 7, to The Kensington, Plainfield, N. J.; April 14, to the Roclere House, Ridgewood, N. J.; April 21, to the Mandeville House, Pompton Plains, N. J.; on Sunday, April 28, a run will be made to the Hotel Central, Perth Amboy, N. J. The club invited members of the North Jersey Automobile Club to participate in the Ridgewood run. On Memorial Day this club intends to hold what is termed a Spring parade. Particulars regarding this will be published later.

PROVIDENCE, R. I.

The formal opening of the new rooms of the Rhode Island Automobile Club took place Wednesday, March 13. It was voted that the sum of \$100 be given to the fund of the Automobile Club of America, for the establishment of satisfactory guide posts along the public highways. The affair was arranged by a committee consisting of Dr. Hibbard, Prescott Knight, Jonathan Chase, Dr. Julian A. Chase and Charles O. Read.

BRIDGEPORT, CONN.

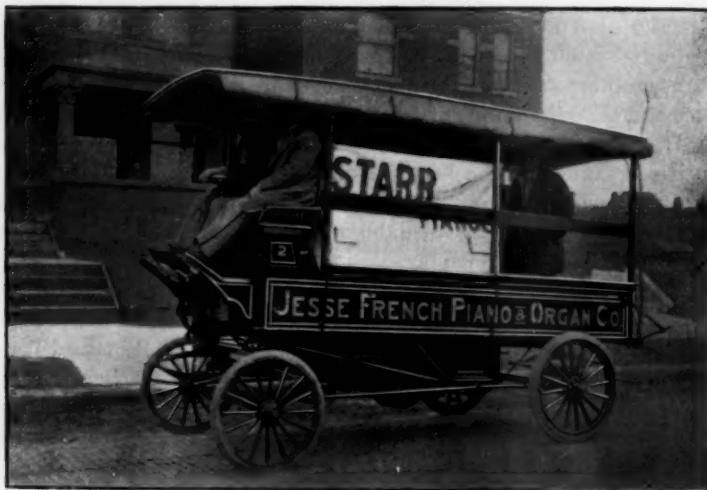
The annual meeting of the Bridgeport Automobile Club was held April 1. In the absence of the President Thomas P. Taylor took the chair. The election of officers resulted as follows: President, Jonathan Godfrey; Vice-President, Louis Cassier; Secretary, Frank W. Bolande; Treasurer, Thomas E. Griffin; Consulting Engineer, Henry M. Hills; Board of Governors (for one year), Clinton Barnum Seeley, John C. Spiers; (for two years), Charles C. Godfrey, George W. Hills. The Board of Governors reported that Dr. Sydney Bishop and Gregory S. Bryan had been elected to membership. A certain sum had been informally pledged to the Automobile Club of America to apply to the work of providing suitable sign posts for the highways, pointing out the best roads for automobiles. It was decided to appropriate the money to placing signs in the vicinity of Bridgeport and have the work done under the supervision of the club. Hartford automobilists will be communicated with in an effort to secure their coöperation. The headquarters for the coming season will be at the "Locomobile" Company's handsome new factory at Seaside Park. A vote of thanks was extended the company for the privileges accorded the club. If enough members desire to have their carriages cared for the same as in a livery stable a storage station will be established in the center of the city. The club now numbers twenty-six active members and looks forward to a season of rare sport. The Runs and Tours Committee, composed of Arthur K. L. Watson, Clinton Barnum Seeley and Thomas E. Griffin, are preparing a program of interesting runs for the summer. It is expected that some of these will consume two or three days.



Two Interesting Vehicles

IT gives us pleasure to present herewith illustration of a piano wagon recently built by the St. Louis Motor Carriage Company, St. Louis, for the Jesse French Piano and Organ Company of the same city.

The wagon has been in service about eight weeks, during which time it has covered about one thousand miles. It is driven by double-



Gasoline Piano Delivery Wagon

cylinder variable-speed gasoline engine of 15-horse power. The cost of operation has been very low, it having been demonstrated that one gallon of gasoline costing 9½ cents will run the wagon about ten miles.

The rear wheels are 38 inches in diameter, while the front ones are 36 inches. Solid tires are used. The wagon is strongly built, and although the transportation of pianos is somewhat heavy work it stands up to it in an entirely satisfactory manner. All of the machinery is below the platform and the general arrangement gives the maximum amount of space for carrying. The capacity for work of this machine has been a surprise to many. It covers one day in actual service

delivering pianos, 69 miles. The weight of the wagon with sufficient water and gasoline for a 75-mile run is about 3,660 pounds. Twenty-five hundred pounds is supposed to be the load, but frequently more than three thousand pounds has been carried. The owners have already discovered that where two wagons were formerly used this wagon has been doing the same work, thus dispensing with the force of men who operated the other wagon.

The wagon is intended to carry three pianos, and is operated by one man.



Gasoline 'Bus

The other illustration is that of a 'bus built by the same company. Fifteen passengers can be carried by this vehicle. It is fitted with a 25 horse-power two-cylinder engine. It is capable of running at any speed up to 20 miles per hour. Its ability to climb hills has been a matter of pleasant surprise to all. The distance between Nashville and Lewisburg is sixty miles.

One striking feature of both vehicles is the great wheel-base, a most desirable thing in itself, to say nothing of the other good points they possess.

Graphite for Engine Slides

A GENTLEMAN in Providence, R. I., writes as follows concerning the use of graphite for automobiles:

"I have already given Dixon's Graphite Pipe Joint Compound quite a test and find it exceedingly satisfactory. I have taken the opportunity to recommend it to the Columbia Sales Department here in Providence for their automobile repair shop. I am also using Dixon's finely pulverized flake graphite, No. 635, mixed with cylinder oil in a sight-feed lubricator and mixed with engine oil for all parts of my steam carriage needing lubrication, and think it is just what I have been looking for.

"I would call your attention to the fact that most steam carriages, notably 'Locomobiles' and 'Mobiles,' have vertical engine slides with absolutely no provision made for lubrication, excepting the occasional dropping of oil on them from an oil can. The vertical position of the slides and the motion of the cross-head together tend to work all the oil off the slide on to the ground in a very few revolutions of the engine so that the slides practically run dry all the time. This mechanical fault of construction will be largely remedied by the use of graphite mixed with engine oil. I expect that part of the graphite will be retained on the slides after all the oil has dropped on the ground."

As flake graphite has a mechanical affinity for metal surfaces, there is probably no doubt that the expectations of the writer of the above will be fulfilled. We may add that any one interested in this subject can easily make test for himself, as the Joseph Dixon Crucible Company, of Jersey City, N. J., will gladly send suitable samples to any one interested.

It is about time a little conservatism was let into the automobile business. The public is growing weary of the statements which have been made generally regarding automobiles. The public has from the very first been led to expect a great deal too much in the average automobile. Now that so many manufacturers are unable to practically demonstrate claims made, a reaction seems to have set in. This is only natural, however, and inevitably follows such a condition of things as has characterized the automobile industry during the last year or so.

Lubricating Oils for Explosive Motors

THE matter of proper lubrication of explosive motors is one which ought to greatly interest users. There seem to be so many automobilists who give so little attention to this that it is little wonder so much trouble is experienced. In this connection it gives us pleasure to quote from J. Veitch Wilson's excellent little book, called "Lubrication of Motor Vehicles and Cycles." In comparing the matter of proper lubrication of steam and gas engine cylinders, he says: "The fundamental difference in respect to lubrication between steam and gas engines consists for the most part in the fact that in the former the presence of a trace of moisture due to the condensation of steam, provides in a slight degree for the reduction of friction in the cylinders and valves, while in the latter the intense heat of the successive and rapid explosions leaves the cylinder absolutely dry and entirely dependent upon the oil introduced for lubrication.

"Fatty oils," he says, "when used for lubricating cylinders of explosive engines are so affected by the heat as to be partially decomposed and resolved into their elements as stearic acid and oleic acid, and the conversion of these into pitch. This, of course, makes their use inadmissible. Mineral oils are not decomposed by heat, at certain temperatures they are converted into gas, but return to their liquid form without any chemical change as the temperature falls. The behavior of mineral oils when exposed to heat varies greatly, not only in respect to their boiling or volatilizing point, but in respect to loss of body at high temperatures. It is obvious that any oil, the boiling point of which is in the neighborhood of the working temperature in which it is to be used, is useless as a lubricant, as, even should it in part retain the form of oil, its body must be so attenuated as to be valueless as a medium in the reduction of friction. But, although the boiling point of an oil may be so high as to ensure its stability at ordinary working temperatures, it is still possible that its body may have been so much reduced at that temperature as to render it wholly inefficient for the purpose for which it is intended. It is, therefore, essential that the oil to be used in the cylinders of an explosive engine should not only have a boiling point well above that of the working temperature of the cylinders, but at that temperature it should retain sufficient

body to insure the presence of an effective film of oil between the cylinder walls and the piston."

To insure satisfaction, lubricating oils for use in cylinders of explosive engines should not be liable to decomposition with liberation of acids and production of pitch at working temperatures. If of mineral origin it must not volatilize to any great extent, nor emit offensive fumes at working temperatures, nor produce carbonaceous deposits in either cylinders or valves. The body at working temperature ought to be equal to that of a good steam cylinder oil at similar temperatures. It should be sufficiently fluid at normal temperatures to permit of its easy introduction to the cylinder or crank chamber by the ordinary appliances. There can be no doubt that to a great extent the offensive odors caused by the use of lubricating oils, which do not possess the proper elements, would be reduced if more care were exercised in the selection of oils to be used.

Book Review

THE second annual edition of *Lee's American Automobile Annual* has been received. The first part of the work is devoted more particularly to a history of the automobile. The greater part of the work is devoted to information regarding the explosion motor as applied to horseless vehicles, though of course the steam and electric vehicles come in for their share of attention. The book contains numerous illustrations and is bound in leather, being of pocket-book size. There are 270 pages, and to those interested in automobiles the work ought to prove of value. Published by Laird & Lee, Chicago.

The flash point of the various hydrocarbons cannot always be remembered off hand. Below is given a table showing the flash points of a number :

	Flash Point.	Fire Point.
Brandy,	69	92
Whisky,	72	96
Gin,	72	101
Petroleum,	73	104
Ordinary high-test petroleum,	110-120	140-160

Endurance Contest of Long Island Automobile Club

THE Long Island Automobile Club's endurance contest which took place Saturday, April 20, was in all respects a decided success. The number of entries was quite encouraging, and the crowd which turned out to witness the event was sufficient evidence of the great interest taken in the automobile by all classes.



Fig. 1. Willett's Point, L. I.

The contest was designed primarily to demonstrate the practicability of the modern automobile and its ability to overcome any difficulties which might beset it when on the road. That the vehicles which entered clearly showed great efficiency was evidenced by the number of carriages which "got through."

There could not be a more satisfactory method of proving to a sceptical public the practicability of automobiles than that adopted by the Long Island organization in this its first test.

The object sought by the members was laudable and might well

be imitated by automobile clubs all over the country. Races are of course good things for a certain class of automobilists, but the average man is looking for a motor vehicle which will "get there" with at least as much certainty as a horse-drawn vehicle.

The drawing up of plans for this contest necessitated much work on the part of those who had the matter in charge. It was necessary to go over the route several times, take numerous photographs, measurement of grades, etc.

The accompanying illustrations are reproduced from photographs taken by Mr. H. B. Fullerton while on one of these preliminary runs.



Fig. 2. East Norwich, L. I.

These will give some idea of the roads at different points along the course.

Fig. 1 was taken at Willett's Point (near Bayside) on the North Shore. In the front carriage is President Adams and Mr. A. R. Pardington. In the second carriage, Treasurer Frederick Webb and Mr. Hopins. The first three are members of the Long Island Automobile Club and Mr. Hopins is with the New York and New Jersey Telephone Company. In the last carriage—a surrey—is Mr. H. S. Chapin, of the Long Island Automobile Club and Captain Ford, of the U. S. Navy. This point is about where the East River meets the Sound. For many years it has been a favorite spot for riders, drivers and cyclists, and it will undoubtedly be extremely popular for automobilists.

Fig. 2 is of East Norwich, on the road between Oyster Bay and Massapequa. This road runs through Jericho and Hicksville. The carriage is a Winton, owned by President Adams, of the Long Island Automobile Club.

Fig. 3 is the beginning of the Jericho Pike, one of the oldest macadam roads on Long Island. This is an almost straight road from Jamaica to Jericho, running through Queens, Mineola and Westbury. The carriage is owned by Mr. H. S. Chapin, who with Mr. Adams,



Fig. 3. Beginning of Jericho Pike

occupies the front seat. On the rear seat is Mr. A. R. Pardington, of the Long Island Automobile Club and Mr. William T. Wintringham, one of the oldest bicyclists in this country.

In our next issue we will give additional facts regarding the race itself, with numerous other illustrations showing the various machines as they appeared on the occasion of this interesting and instructive event.

Uncle Jethro's Will

By JOE LINCOLN

OH, my poor nerves!" whined Uncle Jethro. "I'm a goner this time, Luther. Be a good boy, and look arter Tabby, won't yer?"

Luther Taylor, sitting beside the bed and holding Uncle Jethro's hand, mopped his own bald pate and promised to be a "good boy," "But you ain't goin' ter die, Uncle," he added. "I've seen you sicker'n this afore now."

"I ain't, hey? Who told yer I wan't? Don't yer s'pose I know whether I'm goin' ter die or not? Think everybody's a born gump jest 'cause you be?" The last question, which the invalid shouted at the top of his lungs, was followed by a fit of gasping, coughing and ejaculations. "Condemn this consarned phthisic!" groaned the sufferer. "Here I've spent fourteen dollars and a ha'f on that fool doctor, and he ain't done me one mite of good! I wisht I had him here; he'd be a sicker man than I be, I tell yer that!" Mr. Taylor, evidently being used to his aged relative's outbursts, made no answer, but stroked his grizzled chin whisker meditatively. "Oh, my poor nerves!" wheezed Uncle Jethro. "Where's Tabby? Don't she know I'm goin' fast? 'Course she does," he added; "but she knows I've left her the bulk of my money, and so she don't care how quick I git through. Where is she, anyhow?"

"Last I see of her she was out in the stable talkin' ter McCue. I wouldn't wonder if she was there yit."

"See here, Lute! You don't cal'late there's anything goin' on between them two, do yer? Any sparkin' or nothin' of that sort? Gals will be gals, yer know."

"Tabby's goin' on forty year old," drawled the nephew, drily. "'Seems 'f she might be trusted ter look arter herself by this time, and not heave herself away on a stable boy. Guess there ain't nothin' to worry about on that score. Wall," he said, rising, "I must be goin' out ter look arter the horse now. I'll tell Tabby yer want ter see her. Don't you worry about dyin', Uncle Jethro. You'll be feelin' a heap better in an hour or so."

"I tell yer I won't, neither!" said the sick man, in a roar that

ended in a wheeze. "I tell yer I'm pretty nigh through. Jest 's likes not I'll be gone time you git back inter the house. Look out fer your s'ister Tabby, now? Don't ——"

Uncle Jethro broke off here to rail at his phthisic, and Luther went out of the room and down the stairs, pondering deeply. Although he had pretended that his uncle's suggestion regarding Tabitha's love-making was absurd, he was not sure that it was so. Tabitha was a devout believer in the Swedenborgian creed, but she was anchored no more firmly to its tenets than to the belief that to be an "old maid" was the sum and substance of all earthly disgrace. Her brother knew this, and feared she would let no chance slip to escape the stigma. He would have been glad to see her the wife of some honest, sincere man, but he was far from certain that Mr. Roderick McCue came under that head.

The latter gentleman hailed from New York, and was head groom at the stables belonging to Professor Brassey P. Lyndum, at that distinguished individual's summer estate on Cape Cod. We take it for granted that no further introduction of the illustrious Lyndum is necessary. It may be that the gentle reader is himself one of the "suffering millions who have been dragged from consumption's ravening jaws by Lyndum's Lung Preserver." Perchance Lyndum's Liver Lotion has lifted his foot from the brink of the proverbial grave and placed it upon a pleasanter resting place. At least we are certain that the professor's likeness, with one hand raised to heaven and the other pointing to a box of Lyndum's Phoenix Pills, has more than once been spread before him on the front page of his morning paper.

The great Brassey P., however, and the equally great Mrs. Brassey P.,—who had once been Mademoiselle Vivian, the celebrated lecturer on female beauty and the means of preserving it—were not occupying the Cape Cod mansion at the time of our story. It was now the first of October and the Lyndums had been for a month at Lenox. Luther Taylor and Tabitha were installed in the servant's lodge as caretakers, and Mr. McCue had remained to look after the horses and carriages until such time as the latter should be sent for. Uncle Jethro, in his chronically dying state, was the perpetual guest of his nephew and niece and occupied the best chamber as a matter of course. The old gentleman, the reputed sum of whose wealth varied —according to the imagination of the person mentioning it—from \$1,000 to \$50,000, was known to have made a will leaving the bulk of his fortune to his niece. Mr. McCue had heard of the wealth and the

will, and it is barely possible that they, together with Uncle Jethro's ill health, may have helped to kindle the fires of love in his manly breast.

When Luther reached the stable he found that Tabitha had gone on to feed the pigs and that Mr. McCue was cleaning the automobile surrey. Word had been received a few days before to ship the horses and carriages to New York at once and the animals and a part of the vehicles had already gone.

"When's the go-cart goin'?" inquired Luther, who had a profound contempt for what he called a "steam baby carriage."

"Guess I'll ship her tomorrow;" said Mr. McCue. "You don't seem ter be stuck on autos. Got a grudge against 'em, haven't yer?"

"They don't seem natural ter me, somehow. I can understand that a carriageless horse might be some good, but I'm blessed if I can see the use of a horseless carriage. Long's I've got old Dexter there"—nodding toward his own ancient steed, who occupied a stall at the rear of the barn—"yer'll never catch me aboard one of them things."

"How's the old gent ternight?" inquired Roderick.

"Perty bad, I'm afraid. Cal'lates he's goin' ter die any minute, and I dunno but he is. Goin' now?"

"Yep; I'm going down ter the toolhouse."

"Wall, if yer see Tabby tell her Uncle Jethro wants her; will yer?"

Mr. McCue promised to do as he was requested, and, leaving the barn, walked in the direction of the toolhouse. We say in the direction of the toolhouse because he went only as far as the pigpen. There he saw Miss Tabitha, and, coming up behind her, put his arm about her maidenly waist.

"Hello, my solitaire!" said Mr. McCue.

Miss Tabitha gave a suppressed scream and turned quickly.

"Oh, good gracious me! Roderick!" she exclaimed; "How you frightened me! I didn't know it was you."

"Who did yer think it was? There ain't no other feller tryin' ter cut me out, is there?"

"Why, of course not! You know I wouldn't marry anybody but you. Not if a million men asked me, I wouldn't!" Miss Tabitha spoke as if the million men might happen along and propose at any moment. "Oh, don't!" she giggled, after a pause; "My brother might see you."

"He won't see nothin'! He's up in the barn feedin' that old plug of his. By the way, have yer sounded him about our—well, about the probabilities of his havin' me fer a brother-in-law?"

"I jest hinted at it once and he flared up perfectly dreadful. He'll never give his consent in this world and neither will Uncle Jethro, I'm afraid."

Mr. McCue reflected that, judging by what Mr. Taylor had just reported, Uncle Jethro would not remain in this world long enough to make his consent of much moment; but he did not voice his thought.

"That's what I was afraid of!" he said gloomily; "Well, have yer thought about my other plan?"

"Oh, Roderick! I never could do it! What would folks say?"

"Ah, that's it!" exclaimed Mr. McCue, leaping to his feet, and standing, with folded arms and a savage scowl, the very embodiment of high tragedy; "That's it! I expected it! You've thought it over and yer can't make up your mind ter marry a common groom. Oh, well! Never mind! There's a good deep well on this place and a common groom will make just as big a hole in the water as anybody else. Good by!"

The effect of this ferocious speech was to cause the adoring and alarmed Tabitha to throw her arms about the neck of the would-be suicide and promise to do or say anything—anything if he "only wouldn't." It required at least five minutes of this sort of thing to bring the determined tragedian to a point where he would consent to exist, but at length he did so, and, sitting down upon a log beside the lady of his choice, began a long and impassioned argument. Tabitha appeared to demur at first, but finally gave way and the conference ended thus:

"Oh, Roderick! must it be ternight?"

"It must. Day after termorrow I've got ter go back ter N' York, so it must be ternight or never. And, if it's never, yer know what that means." Mr. McCue jerked his thumb significantly toward the well.

"Good by then, dear, until twelve o'clock."

"So long, my onlyest."

Miss Tabitha, after bestowing a beaming smile upon her knight and receiving a kiss tossed from the tips of his delicate fingers, tripped away to the bedside of her uncle.

Roderick watched her until she passed round the corner of the barn. Then he chuckled.

"Fifty thousand dollars!" he muttered; "That ain't so worse, and the old guy liable ter die any minute!"

At twelve-thirty that night, Mr. Luther Taylor tiptoed slowly and carefully down the hall leading from his chamber. He was lightly and airily attired, but was armed to the teeth. That is to say, he was in his nightclothes and carried a lamp in one hand and an old-fashioned Colt revolver in the other. Burglars were the game for which Mr. Taylor was in search, and he had been lured to the chase by several unwonted sounds, which, breaking upon the stillness of the night, had aroused him from his slumbers.

The first of these sounds was the closing of the back door. While Luther was lying in bed debating as to who could have closed the said door he was again startled by the sound of wheels on the front drive. He jumped up and, looking out of the window, saw some sort of vehicle just going out of the front gate. Then he concluded it time to investigate, and, hunting up and loading the ancient revolver, started on his quest.

He stopped at Mr. McCue's chamber, intending to rouse that gentleman, but found the door open and the room empty. Somewhat surprised at this and with a dim suspicion of the truth beginning to form in his mind, he tiptoed on and cautiously descended the back stairs. No one was in the dining room, but some one had been there very recently for two plates and the remains of an apple pie were upon the table. Also there was a note, and, as it was addressed to himself, Luther opened it and read as follows:

"Dear Brother Lute:

I am going to marry Mr. McCue, and, as we knew it wasn't any use to ask for your consent we have had to elope. We have taken the horse and buggy and shan't be back until tomorrow noon. Give our love to Uncle Jethro and tell him to forgive us. We hope he'll last till we get back. Your loving sister,

Tabitha.

"P. S.—I am awful sorry to be married this way, for I wanted to have a real nice wedding, but you was so dreadful stubborn I had to run away. But I shall be married by a Swedenborgian minister just the same, and that's *some* satisfaction. T."

Five minutes later Luther entered the sick man's room. "Uncle Jethro!" he said.

The invalid awoke with a start, and groaned deeply. "Oh, my poor nerves!" he wailed. "What in time do yer mean by hollerin' at a poor dyin' critter like that?" Then, seeing the look on his nephew's face, he asked, "What's the matter? Is the house afire?"

"Tabby's eloped," said Luther, quietly.

"What?"

"Tabby's eloped. Skipped off ter git married with that McCue feller. Here's the note she left."

Uncle Jethro listened to the reading of the note, and then sat straight up in bed. "Where's my clothes?" he demanded.

"Where's what?"

"My clothes! My duds! Are yer deaf?"

"Why, Uncle Jethro! What are you goin' ter do?"

"Do! I'm goin' ter put a spoke in that feller's wheel; that's what I'm goin' ter do! S'pose I'm goin' to let that poor gal be took in by a chap that's arter her money? It's plain as the nose on your face, and the land knows that's plain enough! He's heard I'm goin' to leave her cash, and so he wants ter git his claws on it. But *I'll* fix his flint! Where's my duds?"

"Uncle Jethro, you git back ter bed! You're awful sick! Yer said yerself yer was dyin'!"

"I don't care! I'd fix that hoss jockey if I was dead! What in the nation are yer settin' there for? Why don't yer do somethin'?" The "dying man" was hopping about the chamber on one leg and trying to pull on a sock.

"But there's nothin' we can do. We don't even know where they've gone."

"Luther Taylor, if I was you, I'd swap my head for a punkin. Tabby says she's goin' ter be married by a Swedenborg'in, don't she? Wall, where's the only Swedenborg'in minister on the Cape?"

"That's so! The only one's at Ostable. But we can't git ter Ostable ternight. They've took the horse and buggy, and I'd have ter walk a mile to rout folks outer bed and borrer another team. And, besides——"

"Oh, be still! You're wuss'n the seven years' itch! Ain't that steam cart out there in the barn? That—that—oughter-mow-somethin'-or-nuther? Didn't yer tell me that thing would go twelve miles an hour, and won't twelve mile an hour git yer ter Ostable 'fore that old hoss can git there?"

When Mr. Taylor pushed the automobile surrey out of the stable

and went into the house to say good-bye to Uncle Jethro he was far from comfortable. In the first place, he knew very little about running the new vehicle. He had seen Professor Lyndum operate it several times, and the professor had condescended to explain something of its mechanism, but Luther was not sure that he remembered much of the explanation. He knew enough, however, to be certain that there was but little gasoline in the tank, certainly not enough to propel the machine to Ostable, and that he should have to buy some when he reached the village. Uncle Jethro met him at the door. The latter was fully dressed, even to an old straw hat and a tippet tied over his ears.

"Are yer all ready fer us to start?" he inquired.

"*Us?*" gasped Luther.

"Sartin! that's what I said."

"But *you're* not goin'—you, a dying man!"

"Goin'! I guess I'm goin'!" Uncle Jethro climbed up to the back seat of the surrey and planted himself thereon. Luther knew his relative too well to offer any further objection. The events of the night were rapidly becoming so bewildering that a man's stepping back from the brink of the grave to take a ride in an automobile did not seem anything extraordinary. He took his seat in front.

"Now we're going to start," he said. "Let's see; which is the thing yer pull? I guess this is it. Here she goes!"

She *did* go, for he had pulled the throttle wide open and the machine started with a jerk that bent Uncle Jethro across the back of his seat like a jackknife and sent Mr. Taylor's feet into the air. He had just time to grasp the steering bar as they shot through the front gate.

Down the road they flew. Luckily the moon had risen and it was now light enough to see the way clearly. Uncle Jethro was rubbing his back and gasping for breath. Luther fumbled for the brake but didn't find it, and they went down the long hill beyond the Lyndum estate at record-breaking speed.

"Say!" panted Uncle Jethro; "this ain't no twelve mile an hour, it's a hundred mile an hour, and it looks ter me as if it 'twould fetch us ter the hereafter instead of Ostable."

Mr. Taylor answered not, but clung for dear life to the steering gear as the surrey went round Perkins' corner on two wheels. Mr. Perkins' dog, who had rushed, a perfect whirlwind of barks, to the

road, saw the approaching juggernaut and departed for the back pasture. At length they whizzed into the main street of Orham.

"Say, Luther! I want ter stop a minute!" shouted Uncle Jethro.

"So do I," answered his nephew; "but I dunno how."

Just at this moment, however, he discovered the brake, and Uncle Jethro's desire was granted. The surrey stopped with such suddenness that the old gentleman shot half way onto the front seat and Luther dropped to his knees with a thump. He rose, groaned, explained to his relative the necessity of procuring some gasoline, and, bidding the latter sit where he was, sprang to the ground and limped off.

Josiah Brackett's store was the only place in town where the needed fuel could be obtained, and Josiah Brackett had sought his more or less downy couch some five hours before. Luther's thumps and kicks at last brought a frowsy head to an upper window and a voice demanded to know what was wanted. The thumper made known his need.

"Go on!" said the voice. "This ain't no 'pothecary shop. I don't keep vaseline."

"Who said anything about vaseline?" howled Luther, now thoroughly out of patience. "Gasoline's what I want. G-a-s gas, l-e-a-n line, gasoline! D'yer understand that?"

It may have been the phonetic spelling which impressed Mr. Brackett, but, be that as it may, he came down stairs after a time, procured the gasoline and offered to help Luther carry the can containing the same over to the automobile. When they arrived there Luther was alarmed to find that Uncle Jethro had disappeared. He began to shout the old man's name, and was relieved when his hail was answered. Soon the missing passenger appeared, accompanied, to his nephew's wide-eyed amazement, by a companion. This companion, who looked about half awake, was a superannuated old justice of the peace, who had formerly been one of Uncle Jethro's bosom friends.

"Luther," said Uncle Jethro, "this ere's Jedge Bean. He's goin' 'long with us."

"But I tell yer I *can't* go, Jethro!" expostulated Mr. Bean. "I'd git my death of cold ridin' way over ter Ostable ternight!"

"Rubbish? I guess if I can git up off a sick bed, and a *mighty* sick bed at that, you can stand it. See here, Laban Bean! Didn't I git you made Sheriff of this county in '51?"

"Yes, Jethro ; I admit you——"

"And didn't yer say then : 'Jethro Parker, if there's any favor I ever can do fer you, jest let me know.' And ain't this the fust favor ever I've asked of yer?"

"Yes, Jethro ; I know it is, but——"

"Then, don't say another word. Git in!"

The unwilling justice hoisted himself into the vehicle and Uncle Jethro followed. Luther, who was having some difficulty in evading Mr. Brackett's questions as to the reason for the nocturnal excursion, climbed to his seat and grasped the lever.

"Look out when she starts, Laban!" advised Uncle Jethro.
"She's a hoosier when she starts!"

But she started much less violently this time, for Luther had learned by experience. Also the brake helped him, and their descents of the various hills were not such hair-raising experiences as the first had been. They left Orham and took the wood road to Harniss, the next town. Luther, whose entire attention was given to his steering, had but a vague idea of what his companions were doing. He knew that the occupants of the back seat were deep in animated conversation, and a hasty backward glance showed him that Uncle Jethro was holding a lantern, which he had insisted upon bringing from the house, and that Mr. Bean appeared to be trying to write something, and was finding it difficult. It was nearly four o'clock when they came out upon the macadamized State road, which runs directly through Ostable.

"How much further is it?" inquired Uncle Jethro.

"Only about three mile," answered Luther. "We're on the State road now, and I can let her out."

"Think we've got ahead of 'em?"

"I cal'late so ; though the roads have been so bad that we ain't made twelve mile an hour, nor nothin' like it. Hold on! What's that ahead?"

They were passing over the brow of a hill and the road lay clear and white before them in the moonlight. There was a black something upon it that moved rapidly. They listened and heard the sound of wheel and hoof.

"It's them!" shrieked Uncle Jethro ; "Let her out, Luther! let her out!"

And Mr. Taylor "let her out."

Down the hill like an avalanche came the surrey, to the accompaniment of excited yells from Uncle Jethro and his nephew and

groans from the terror stricken Mr. Bean, who thought his last hour had arrived. Before Luther could collect himself sufficiently to apply the brake they shot past the buggy containing the eloping couple. Shouts, screams and then a crash came from behind. Mr. Taylor, suddenly awakening to a realization of his duties, put on the brake with all his force and went over the dash-board. He picked himself up and ran back toward the buggy, leaving Uncle Jethro gasping, with his chin over the back of the front seat, and Mr. Bean groaning dismally on the floor beneath.

The buggy was overturned in the ditch beside the road and Dexter seemed to be trying to climb a tree. His staid old nerves had not been proof against the screaming hurricane that had just gone by and he had tried, for the first time in his life, to run away. Mr. McCue was helping the sobbing, but unhurt Tabitha to her feet when Luther came up.

"What d'yer mean?" demanded the latter of the disheveled Roderick; "Let that lady alone! Tabitha Taylor, ain't yer ashamed of yourself? Now you come home with me this minute!"

"I shan't!" screamed the lady addressed.

"Look here you!" said Mr. McCue, so suddenly that Luther jumped. "What right have you got ter chase this lady and scare her nearly ter death? She's over age and you ain't her guardeen, so she's got a right ter do jest what she pleases, and don't yer fergit it! Go home yerself, 'fore yer git inter trouble."

Mr. Taylor was dumfounded. The idea that his sister could not, against her will, be compelled to leave her lover had not occurred to him before. He was mentally preparing an appeal to Tabitha's good sense, when he was saved the trouble of delivering it.

"See here, you hoss jockey!" said a voice behind them.

"Heavens and earth! Uncle Jethro!" gasped Tabitha.

"Good Lord! it's the dead man!" screamed Roderick.

Uncle Jethro and Mr. Bean had come up unnoticed. The former carried the lantern and the latter had a paper in his hand.

"You scalawag!" sputtered Uncle Jethro; "Mebbe I ain't so dead as you was hopin' I'd be. Now you listen, all of yer, ter what's goin' ter be read. This 'ere's Jedge Laban Bean, and him and me's been doin' a leetle lawyer bus'ness on the way down. Put on yer specs, Laban."

Uncle Jethro held up the lantern and Mr. Bean, donning his spectacles and unrolling the paper, began to read as follows:

"Last Will and Testament of Jethro Goodspeed Parker."

"That's me, yer understand! *me!*" interrupted Uncle Jethro.

"Whereas, I Jethro Goodspeed Parker, being of sound mind, and—"

"Skip that, and git down ter business!" commanded the "dying man."

"Et cetera, et cetera," muttered Mr. Dean, hurrying down the page. "Do hereby give and bequeath, at my death, all my worldly goods, namely, to wit: twenty-five acres of cranberry swamp, five acres of pasture land, situated in—"

"Never mind itemizin'," said Uncle Jethro. "Read the last part."

"Et cetera, et cetera,—ahem—said properties to be sold and the proceeds divided as follows: One-third to my nephew Luther Jackson Taylor, and the remaining two-thirds to my niece Tabitha Ann Taylor, provided—"

"Open yer ears, now!" shouted Uncle Jethro.

"Provided that she does not marry the man known as Roderick McCue. Should she marry the said McCue, her portion shall revert to her brother, the said Luther Jackson Taylor, and she shall not receive a cent."

"Ah, ha!" shouted the bequeather of cranberry swamps, dancin' derisively before Mr. McCue. "How's that strike yer? Not a red cent!"

Mr. Bean was proceeding to read the remainder of the will, signatures, etc., but Tabitha broke in upon him.

"Oh, Roderick!" she cried, rushing toward her prospective husband. "It shan't make one mite of difference. I'm jest as willin' ter marry you, even if I *be* poor."

But Mr. McCue, whose expressive countenance had lengthened considerably, during the reading of the document, fended off the embrace of his self-sacrificing sweetheart, and demanded; "I say, old sport, is that straight?"

"What, sir?" said Mr. Bean, who was somewhat offended at being addressed as "old sport."

"I say is that paper straight? The real thing, yer know?"

"If you mean to ask if the will you have jest heard read is a legal document, I answer yes."

"Well!" said the philosophical Roderick, smiling cheerfully, "then I guess I'll have ter pass. You've got too good a hand for me,

old gent," he added, turning to Uncle Jethro, "and I will say that you're the spryest dyin' man ever *I* struck!"

"Roderick!" shrieked the frantic Tabitha, "say you'll never desert me!"

"'Fraid I can't, m'dear. Long's yer had the cash comin' yer way I was willin' ter be 'yours forever,' but when uncle here has said it ain't ter be, why, it's 'farewell, farewell, me own true love.' Fact is, if I had ter marry fer love alone, I wouldn't be satisfied with anything short of a \$10,000 prize beauty, and I'm 'fraid you ain't quite up ter the mark."

Well, it was a harrowing scene. Tabitha fainted four separate times before she was placed in the buggy—which had been set on its wheels again—and started on her homeward way. Mr. Bean, who seemed to be a bit shy of the auto, volunteered to act as driver.

Uncle Jethro and Luther took their places in the surrey. Mr. McCue had been left, swearing energetically, by the wayside. He had, at first, insisted on riding home with the others, but Uncle Jethro, to his nephew's admiring amazement, produced from his pocket the ancient Colt and its persuasive muzzle worked wonders in causing the groom to change his mind.

When they were well on the homeward trip Luther remarked:

"I'll never say another word agin horseless carriages. If we hadn't had this one we'd never have stopped that marriage in the world. But the whole thing was your notion, Uncle Jethro. You've been the smartest, spryest, liveliest—"

He was interrupted by a frightful groan from the back seat.

"Consarn this everlastin' phthisic!" wheezed Uncle Jethro. "Oh, my poor nerves! I say, Luther, if I don't last till we git home, see that there's some posies planted round my grave, won't yer?"



Notes From Abroad

MR. Mark Mayhew, a prominent member of the Automobile Club of Great Britain and Ireland, was recently elected a member of the London council. He canvassed his constituency in an automobile, and other members assisted him by allowing him to use their private machines.

A club garage (storage station) for members of the Automobile Club of Great Britain and Ireland, is being got ready by Mr. Harrington Moore, in a building next to the Royal Aquarium, Westminster. Not only can motor vehicles be stored there, but repairs and cleaning will be attended to thoroughly at inclusive moderate prices, from 8 A. M. until 12 midnight. The proposition in connection with this scheme is that the garage should be confined to members of the Automobile Club, provided that 22 members take season tickets at 90 dollars per annum.

Just now the subject of brakes is receiving great attention over in Great Britain, and already a suggestion has been made to prohibit carriages from entering the Automobile Club events, unless equipped with brakes which act both backwards and forwards.

Arrangements are already in hand for the holding of an international motor car exposition in the city of Turin, Italy, in the spring of 1902.

Sir Courtenay Boyle had an article in the March number of *Macmillan's Magazine* entitled "The Coinage of Words." He referred incidentally to the nomenclature of automobilism, and stated that "motor" is better than "automotor." He also suggested the word "auto-kion" as a substitute for "automobile," "auto-car," or other means of designating a self-propelled vehicle.

It was reported some time ago that Mr. Lemaitre would have built a 100 horse-power racing car. This, however, has been slow in coming

to the front, and now it is said that three of similar power are to be constructed by the Belgian Arms Factory of Herstal-les-Liege. These motor carriages will follow the Jenatzy system by using a motor in conjunction with a dynamo. When the carriage is at a standstill, or the full power is not required to drive the vehicle, the motor recharges a battery of accumulators, but when power is required in excess of that developed by the engine the dynamo is used as a motor, and as in the cars now being constructed the petrol engine develops sixty horse-power and the electric motor forty horse-power, it is easy to see what a tremendous force will be exerted when it is required to get up a high rate of speed or overcome any great resistance. The owners of the new vehicle are MM. Jenatzy and De Caters, and a French gentleman whose name is not given; they are intended to take part in the Paris-Berlin and other important races in the coming season.

The Sargent Company's Wrenches

WRENCHES are very necessary to the automobilist, and in this connection we are pleased to refer to the product of the Sargent Company, of Chicago. This company has for some years been engaged in the manufacture of castings by what is known as the Tropenas process. Wrenches also are made by this process and are in every respect equal to forgings. They can be made as hard or soft as may be desired, and what is more, at considerably less cost. This company makes these wrenches of every size and style, and those interested will be given full information upon communicating with the company named.

We have been somewhat surprised at the large number of—we were almost going to say absurd—claims which are sent into the Patent Office from time to time, for devices connected with the operation of automobiles, brakes, motors, etc. It would seem as though the number of people who had unlimited confidence in the advent of the automobile to find a field for all the freak devices which are being devised was very great.



(We desire those interested in both the manufacture and operation of Automobiles to send in for use, in this department, whatever they think may be of interest to us or our readers.—EDITORS.)

Two Experiences Showing the Personal Factor

I AM fully convinced that the majority of troubles which a great many automobilists have are their own fault—either from carelessness or ignorance of the strains which material will safely stand. I have two friends—modesty prevents me citing my own case—both of whom have steam carriages, and their experiences have been exactly opposite.

One is an insurance man, who has mighty little ideas on mechanics, and who hasn't the faintest idea why a piece of low carbon steel won't stand as much as the best steel made. He drives his carriage recklessly, takes curb stones at any speed he happens to be going, and—has breakdowns as a matter of course. He recently made a long trip, and swears that it cost him a dollar a mile—rather expensive traveling.

My other friend is a mechanical engineer, has a machine of the same make, and they are as near alike as modern manufacturing methods can make them. He has had his machine nearly a year—has given it very little attention (the cleaning and care being all done by his stable man) and has not spent a dollar for repairs.

He understands the strength of material—knows what it ought to stand, and avoids subjecting it to unnecessary strains, especially on bad roads. His experience has all been favorable to the steam carriage, although I fully believe he would get along with any kind. It's another case of the "personal factor" being a very important one.

Those who only hear of the experience of the first man will not be apt to buy an automobile, while those who know the latter are probably looking for one now. These personal experiences affect sales largely, and we ought to have both sides of the question.

NEW YORK.

FRANK C. HUDSON.

The Horse-Power of Carriages

ONE of the most puzzling features of selecting an automobile is the question of horse-power. When the would-be purchaser finds a little machine with a 3 to 5-horse motor and a large machine with 8 to 12 horse-power, he begins to wonder what horse-power really means, and whether there isn't a big difference in the size of horses. The power of a motor depends both on its size and the speed at which it runs (leaving out the question of pressure in the cylinders) and the effective power depends on how much is lost in transmission.

Assuming that all the driving mechanisms are equally effective and that the rated horse-power reaches the rim of the wheel, we can do a little calculating along locomotive lines—allowing, of course, for the difference in resistance to driving due to the roadbed. Locomotive traction on steel rails varies from 6.5 pounds per ton hauled at 5 miles an hour to 10 pounds per ton at 30 miles. English figures give road traction on ordinary macadam at 50 to 60 pounds per ton, on best clay at 110 pounds and sand road at from 360 to 560 pounds per ton. Calling 200 pounds per ton as liberal allowance for any ordinary case we can figure a little on motors and weights. As it is easier to figure in hundred pounds than in tons we can call it 10 pounds per hundred, or 10 per cent. of weight in tractive power. Taking 10 miles an hour as our basis we have 880 feet per minute, and dividing 33,000 (because 33,000 pounds raised one foot in one minute is the standard of horse-power) by 880 we have 37.5 pounds pull for every horse-power exerted.

Taking a carriage which weighs 1,000 pounds with passengers, and at 10 pounds per hundred we have an allowance of 100 pounds pull. Dividing by 37.5 gives 2.6 horse-power as the required amount. Now, with a carriage weighing 2,000 pounds loaded, we see that just double this amount of power is necessary and that a 5.2 horse-power motor is needed to accomplish the same results. This lets a little daylight into the question for some of us laymen who get twisted. I had an engineering friend figure it out for me, and it cleared the problem considerably. Perhaps it will for others as well.

PASSAIC, N. J.

HENRY FRANKLIN.

A Recent Visit to Coventry

THE well-known Daimler works were very busy, and it was a treat to walk through the vast sheds stocked with machinery and cars in every stage of construction. The first to claim attention was the splendid new 20 horse-power vehicle, built to the order of Mr. Talbot Clifton. This magnificent car is up-to-date in every respect and fitted throughout with roller bearings. The four-cylindered engine has both tube and electric ignition, and the workmanship throughout is of the finest description. The firm may well feel proud of turning out a car so far in advance of its predecessors.

They have also made a new departure in the shape of a double-cylinder 9 horse-power motor, which will meet the public demand to a certainty. The Daimler Company has always been celebrated for the strength and solidity of its construction. Hitherto, they have, perhaps, rather erred in putting 5 and 6 horse-power engines on large cars weighing close on one ton. But this mistake they have now entirely overcome, and the tendency visible in the works is all towards increased power, combined with improved transmission and less weight. The new 20 horse-power cars ought to fill all automobilists with envy and admiration.

We profited by the opportunity of being in Coventry to visit the Singer works, where we saw the Singer motor bicycle in action. It may be briefly stated that its ease of manipulation is undoubted. A gentleman who accompanied us and who was entirely unacquainted with motors got on the machine and at once rode it with the greatest ease. The bicycle possesses many points of ingenuity, which entitle it to favorable notice. But the placing of the motor within the driving wheel renders it very difficult to repair in case of a break down. A broken exhaust valve or spring would be extremely hard to tackle by the roadside. On pointing this out to Mr. Perks, the clever inventor, he admitted it was a weak point, and some means ought certainly to be devised for rendering the various parts get-at-able. The running of the bicycle apparently left nothing to be desired, but an extended trial is necessary to ascertain the merits and demerits of these and similar machines. The makers claim complete immunity from side slip, owing to the low center of gravity. In motors, as in everything

else, theory is one thing, practice another. The Singer bicycle is certainly worthy of consideration, whether it prove merely an ingenious toy, or a formidable rival to the Werner and other makes. The Singer firm is also turning out tricycles, with the motor fitted within the front wheel and the driving wheels and frame similar to that of an ordinary tricycle. On some future occasion we hope to have the pleasure of trying one, when we shall be in a position to give our experience as contrasted with the $2\frac{3}{4}$ De Dion, which we are in the habit of riding.

It is not given to everybody to ride on a 16 horse-power Napier. We had this privilege a short time ago. The car belonged to that well-known automobilist Mark Mayhew, Esq. When the Leviathan got into her paces it was a treat. Steady, sure, swift, she well deserved the encomiums of the press and general public. Only when one glanced at the vanishing hedgerows did one realize the speed at which she was traveling. Strong as a lion, fleet as a greyhound, she had but one fault. She put us out of conceit with our modest "Sir Charles" boasting but 9 horse-power. Would that we were all Croesuses. Alas! That cannot be. Rightly has Mr. Mayhew christened his splendid car "The Great Northern."

MARKET HARBOROUGH, ENGLAND.

MARY E. KENNARD.

Automobiles on the Installment Plan

WE note in your March issue an article apparently favorable to the sale of automobiles on the installment plan and over the signature of Alfred Lamsdon, of Winchester, Mass., and I take the liberty of replying to the same in brief.

Those who have been connected with the sale of any commodity from the point of view of a manufacturer, which article has secured its popularity through its sale on installments, are aware of the tremendous disadvantages to such manufacturer. This installment business permits the purchaser to purchase that which he cannot afford to pay for and in many cases that which he has no use for except in order to keep pace with some of his friends more fortunate in the possession of this world's goods.

Furthermore, many disadvantages accrue to the seller by the marketing of an article used on the common roads when sold on the

installment plan because of the loss necessary in the sale of such second hand article if it becomes the right of the seller to take such article from the purchaser for the non-payment of his installments. And the sale of automobiles on such a plan, would, in my judgment, redound to the tremendous injury of both the manufacturer and the dealer for the reason that even though these vehicles have come to stay, they are and always will be a machine and some users will understand them better than others, so that the chances are that the dealer in taking an automobile back from a delinquent will find such vehicle in very bad shape and almost unsalable.

JAMES S. HOLMES, Jr.,
Remington Automobile and Motor Company.

A New Sparking Plug

THAT much trouble incidental to explosion motors comes from poor ignition is well known. The more efficient the igniter can be made the better service will be given. The liability of the ignition plug to get out of order in many different ways is also patent to all automobilists, and any thing designed to lessen these troubles ought to be welcomed by them.

In this connection it gives us pleasure to present an illustration of a new sparking plug, designed by Mr. E. T. Birdsall, of the Desberon Motor Car Company, New Rochelle, N. Y., and which he has just placed on the market. An interesting point about this plug is that no packing is used and it is an easy matter to repair it on the road, as spare pieces can be carried, and can be slipped in when necessary.

The small porcelain is fully protected, while the larger piece is, owing to its large section, practically unbreakable.

Mr. Birdsall informs us that he has used one of the plugs steadily for two months at a time without having to touch it once. They are patented in England, France and America, and are sold for one dollar each.



Of Passing Interest

(Readers will confer a favor upon the editors of this magazine by sending in any interesting item of news suitable for this department.)

Mr. A. L. Dyke, who was formerly manager of the St. Louis Automobile and Supply Company of St. Louis, has now embarked in business for himself and will continue to furnish engines, running gears and carbureters, and will also handle all kinds of automobile supplies. His office is located in the Linmar Building, St. Louis. All parties who are interested in automobile parts and supplies will do well to send for Mr. Dyke's new 16-page catalogue. We wish him success in his new venture.

The city of Charleston, S. C., is planning to hold an Exposition from December 1, 1901, to May 31, 1902, to be known as the South Carolina Inter-State and West Indian Exposition. The exhibition will be quite comprehensive in scope, and it is expected it will reveal to the world the remarkable development of the Southern States during the last twenty-five years of the just closed century. Many of the States have already signified their intention of erecting State buildings and making State exhibits.

Alexander Winton, who has already made some very successful long distance runs, contemplates an automobile trip between San Francisco and New York. The experiences of such a journey will, to say the least, be full of vital interest to all automobilists, and its carrying out calls for the making of a great many plans for the obtaining of fuel, etc., and some time will be occupied in doing this. There are of course a number of routes, but any one of them presents almost insurmountable difficulties to the automobilist. It is understood that Mr. Chas. B. Shanks will be Mr. Winton's running mate.

Recently George C. Clausen, president of the Department of Parks in this city, expressed his opinion of the Doughty automobile bill. Generally he commends the bill, but thinks it ought to be in the power of supervising bodies of the parks to say just what types and sizes of motor vehicles shall be allowed to enter. He said that the closest restrictions have hitherto been necessary to prevent dangerous and objectionable vehicles from entering the park, but as the Doughty bill makes no distinction as to size of motor carriages that may enter

he fears they may be as large as street cars and even more dangerous, inasmuch as their line of route is uncertain. There does not appear to be any good argument why the automobile should be barred from any park. As a matter of fact the very horses which are driven through our parks are compelled to meet automobiles on the common thoroughfare, and there would seem to be no good reason for barring the motor vehicle from the parks on that score.

The Peerless Long Distance Steam Carriage Company is the name of a new concern recently organized, and which will engage in the manufacture and sale of motor vehicles and supplies of all kinds. Among other things which this new and enterprising concern has produced is an automobile engine of the compound marine type, with cylinders $2\frac{1}{2} \times 5$ inches with a 3-inch stroke. If desired, engines of larger dimensions may be obtained. In these engines the steam chests are cast in one piece with the cylinder. The material used is of the best quality and the workmanship is also of the finest. This same company is manufacturing a new compensating gear, in which spur gears only are used. All parts are held in a dust and dirt-proof covering, which, when filled with vaseline, ensures perfect lubrication for an indefinite period. The Peerless Company is also marketing other devices, such as running gears, kerosene burners, etc., and has entered the field under most favorable circumstances.

The Electric Vehicle Company has obtained two Government contracts for automobiles. One is for the transmission of mails between the Pan-American Exposition grounds and the Buffalo Post-office. The other is for the distribution of books from the Congressional Library at Washington, D. C. For these services the company will use a Mark XI delivery wagon.

Below is given a list of exhibits the company is going to have at the Buffalo Exposition :

Mark III phaeton, Mark VII tricycle carrier, Mark VIII gasoline runabout, Mark XI delivery wagon, Mark XI wagonette, Mark XI six-passenger 'bus, Mark XII runabout with wooden wheels, Mark XII runabout with buggy top and wire wheels, Mark XII victoria with wire wheels, Mark XII victoria with canopy top and wooden wheels, Mark XVI extension front brougham, Mark XIX surrey, Mark XIX cabriolet, Mark XIX rear boot victoria and Mark XIX delivery wagon.

The De Dion-Bouton Motorette Co. has reduced the prices on the smaller sizes of genuine imported air cooled motors.

The $1\frac{3}{4}$ horse-power genuine De Dion air cooled motor which has always sold at \$150.00 with accessories, will now be sold for \$125.00 with accessories. This motor is particularly adapted to the requirements of motor bicycle manufacturers. It is none too powerful for that work, and yet it weighs only forty-five pounds, thus making a very desirable power for cycles, etc. The speed of the $1\frac{3}{4}$ horse-power motor averages from 1,800 to 2,200 revolutions a minute. At 1,800 it will develop its rated power.

The $2\frac{1}{4}$ horse-power genuine imported De Dion air cooled motor has been reduced from \$200.00 to \$150.00 with accessories. This motor is particularly suitable for tricycles, quadricycles, racing bicycles or motor tandems. When fitted to any one of these types it will not overheat under full load or speed. In fact this motor is used by practically all of the motor tandem riders in the world. The average speed of this motor is from 1,500 to 1,800 revolutions per minute, at which speeds it will develop its full power.

The Automobile Headquarters of Boston will soon have a new building, the contract for this having been let. It will have five stories and basement, and will be located on Stanhope Street, near Trinity Place Station.

There will be 5,500 square feet of space on each floor, which will be heated and lighted by a power plant located in the building. A power elevator large enough to accommodate anything in the automobile line from a giant Panhard to a De Dion "quad" will be one of the features of the building. It is proposed to brilliantly illuminate the front of the building to enable automobilists to locate it when approaching from any quarter.

All the latest modern appliances for the proper storage and repair of automobiles of every kind will be used by this new establishment.

P. G. Lewis, the present manager of Automobile Headquarters, 33 Stanhope Street, will continue to conduct their business in the new establishment, which is an assurance that patrons will receive every possible attention. The motoring public of Boston are sure to find this new establishment a real luxury in its way. Automobiles will be delivered and called for, and the building will be open day and night the year round to accomodate transient as well as local custom.

An Automobile Trip Through the Sahara

IN our April number we printed an article entitled "Across the Desert," in which reference was made to a Frenchman who had succeeded in driving an automobile across the desert to Suez. The writer of the article expressed an opinion to the effect that probably soon it would be possible to travel from Cairo to Suez on schedule time at, say, about \$20 for the round trip.

The following story of a most interesting journey in South Algeria undertaken by Baron Crawhez and party comes very near to the hopes expressed in the article just referred to, and while the voyage was not exactly from Cairo to Suez, it was nevertheless through a part of the globe in which an automobile had never been seen before. The effect the sight of a horseless carriage must have had on those men of the desert was, to say the least, unique. Truly, they must have considered the Baron and his party as nothing short of miracle workers. Baron Crawhez, from whom we received the accompanying photographs, is a member of the Automobile Club of Belgium, and we feel sure the pictures and accompanying description will be read with great interest.

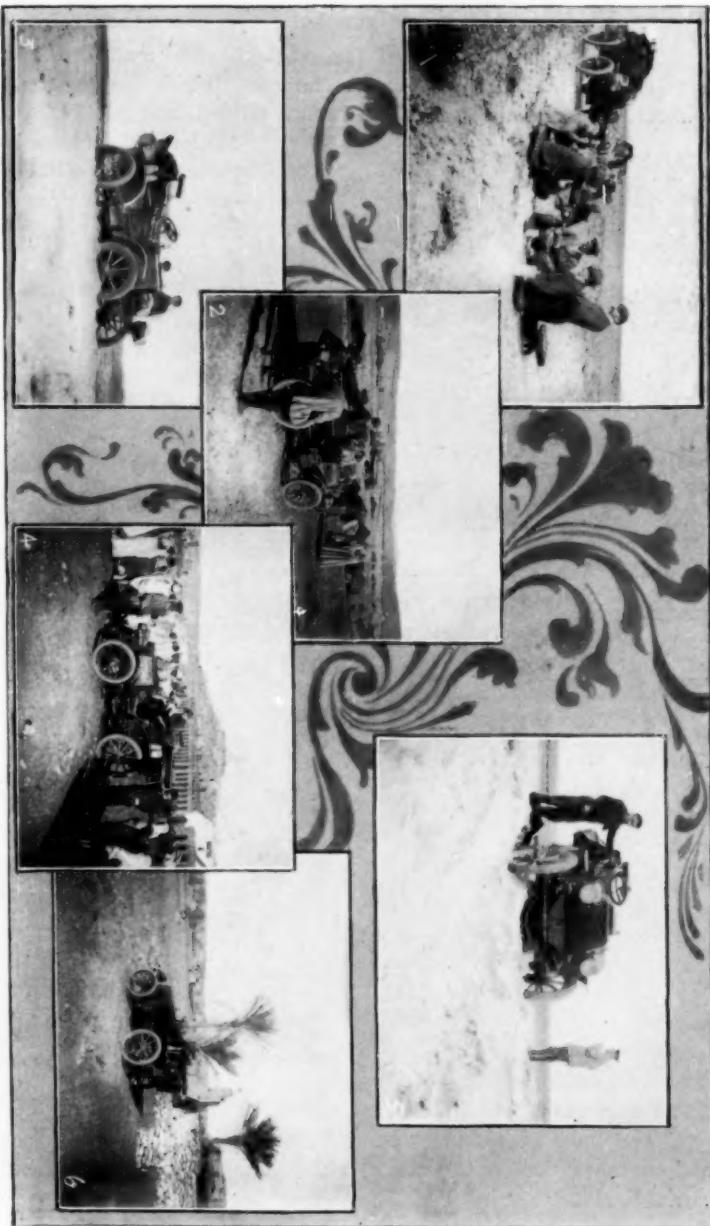
The fact that the vehicles were able to make the journey without very serious accident ought to be sufficient proof of the practicability of the modern automobile, and give it a place in the category of efficient and satisfactory methods of transportation.

The natives who were passed by the machines on the route are said to have appeared surprised and frightened, and ran away, shouting, "They are the devil's machines."

By reference to some of the illustrations, it will be seen that such a trip must have been attended with peculiar interest outside of the practical demonstration of the automobiles' ability to make the journey in the face of such adverse conditions. To travel in the Sahara in an automobile is suggestive of romance, to say the least.

The party left Algiers February 4, starting toward Médéah. It followed the well-known and picturesque route through the Chiffa mountains. This road is noted for its beautiful scenery, though not at all one of the best for automobiles. However, the travelers expected to encounter very unwelcome snatches as they went along, and so were not disappointed.

Breakfast in the Desert



Along the Route

Through the Sand

In the Market Place at Gardhaia

Getting Water

The following day Boghri was reached. The mountains in this section are covered with luxuriant forests. It was found extremely difficult to make the descent of Mount Grenot, and called for great caution on the part of those who operated the vehicles. To drive an automobile through a country such as was invaded by Baron Crawhez and his party calls for special caution. A man must be pretty well balanced to successfully navigate along such roads and down such grades as were encountered on the journey in question.



Gardhaïa. Automobile Surrounded by Natives

made at 9 A. M. for Djelfa, about 167 kilometers (103 miles), but the bad condition of the roads would not allow the vehicles to make more than about 15 kilometers, or 9 miles, an hour.

The travelers now reached the Plains of Marabout and were favored with a view of the beautiful rock, said to be composed of salt.

The close of the following day, February 7, found the automobilists at Laghouat, 125 kilometers (77 miles) from Djelfa. Some parts of the journey it was very hard going—between Djelfa and Ain-Elibel this was especially

so. The hubs of the machines were buried in sand in some places, and on more than one occasion was it found necessary to push the carriages along.



The Stage

When the party entered Laghouat there was great commotion among the natives. A number of the city officials of the place tendered the travelers a very warm reception. What surprise must have

been caused by the incoming of such an unusual—and to their minds unnatural—form of conveyance can be better imagined than described.

One week was spent in this, in many respects, remarkable city. Pleasant excursions were made to various points around the city. The view

one can get of the Sa-

hara from the tower of the city hospital is unique.

A start was made for Gardhaïa on the morning of February 13. While on the way large numbers of carcasses of camels were passed—in fact it was a usual thing to encounter them. At last the famous oasis of Berrian was reached. Here a halt was made. The party was especially interested in the peculiar method of washing clothes. This is done by simply banging them against stones. It does not seem at all probable that such a plan would tend to cause buttons to remain long.

At Gardhaïa the inhabitants were very hospitable. Some of the more "progressive" of them were bold enough to take a place in one of the "devil's machines." (See illustration.)

McZab was the next city visited. This is beautifully situated on



Arrival at Oasis of Berrian



A Snap Shop of No. 156

the side of a hill, and presents a striking appearance when approaching it. From here also numerous excursions were made to surrounding towns.



A New Chauffeur

A return was made to Laghouat on February 18; thence to Djelfa. On the 22d a start was made for Bousâada. Here the roads were good, but the city of Bousâada is merely a desert town. Aumale was reached on February 25. The following day a move was made for Algiers, where the travelers found a more advanced condition of things.

The result of this interesting journey showed

conclusively that 80 per cent. of traveling expenses had been saved, besides securing about ten times the speed. The participants were not endeavoring to set up any new records. Altogether 400 miles were covered on the journey.

The photographs kindly sent us by Baron Crawhez will be of interest, and he and his friends have by this most romantic experience demonstrated that the automobile, if properly built and operated, can be used to advantage wherever the horse or camel can.

Automobile Plans for the Buffalo Exposition

BUFFALO, with her beautiful tree-embowered streets and parkways, will this summer be the Mecca of the Automobilists of the Americas.

As a result of a conference held in Buffalo between William I. Buchanan, Director-General of the Pan-American Exposition, and a committee appointed by the Board of Governors of the Automobile Club of America, consisting of Albert C. Bostwick, Percy Owen and J. M. Hill, all of New York City, together with Thomas M. Moore, Superintendent of transportation exhibits, and the Sports and Athletics

Committee of the Exposition, it was decided to hold a grand International Road Race of two hundred miles from Buffalo to Erie and return, as the culmination of a week of automobile sports at the Pan-American Exposition. To arrange and carry out the program of the tournament, Director-General Buchanan has appointed a committee of automobileists to act in connection with the Sports and Athletics Committee of the Exposition.



A Street in Laghouat

Mr. Malcolm W. Ford will be chairman of the special committee, and his associates will be Mr. J. M. Hill, who will represent the electrical ve-

hicle interests; Mr. Percy Owen, representing the gasoline vehicle interests, and Mr. S. T. Davis, Jr., representing steam vehicle interests. All four are members of the Automobile Club of America, and Mr. Davis is also president of the National Association of Automobile Manufacturers. The fifth member of the committee is Dr. Truman J. Martin, president of the Buffalo Automobile Club.

Though the program of the tournament, which will be held in the Stadium, has not been arranged, it has been suggested that trials to test the mobility and economy of the various types of motor vehicles, obstacle and hill-climbing contests, brake contests, and pursuit races be included in it.



Another Scene in Laghouat

The tournament will take place during the week beginning September 16. It is intended that the International speed contest over the famous Buffalo-Erie course, shall rank with the famous long distance automobile races held annually in France. This contest will be the feature of the week of automobile sports and tests, and will be open to self-propelled vehicles of all types and all countries. Large purses and valuable cups and medals will be presented to the winners.

During the week preceding that of the Motor Vehicle Tournament at the Pan-American Exposition, the Automobile Club of America will hold a tour or endurance test from New York to Buffalo as a practical demonstration of the utility of motor vehicles.

This run will not be a speed contest, as the object of the trip is to demonstrate the possibilities of the various types of motor vehicles under all conditions of weather and roads.

The awards will be made on the following basis:

First.—Vehicles making the fewest stops en route.

Second.—Vehicles carrying the highest percentage of pay load.

Third.—Vehicles requiring the least repairs.

Automobilists of all countries are invited to participate and valuable cups and medals are to be given as prizes. The course is to be up the Hudson to Albany and thence across the State to Buffalo, a distance of about 460 miles. The route to be followed will be definitely fixed by a committee appointed by Mr. A. R. Shattuck, president of the Automobile Club of America.

Ideas of Inventors

(Copies of patents can be obtained from Patent Office, Washington, D. C., by sending five cents in coin.)

Edward Y. White, of San Antonio, Tex., has just invented a motor bicycle the engine of which has its shafts project from slots in the case. A chain drive is used. The engine is mounted within the casing. Patent No. 670,010.

Patents for automobile running gear are frequently being taken out, and one of the latest is that of William Van Wagoner's, of Syracuse, N. Y. This consists of two rear cycle castings arranged in line with each other and held together by means of side frames. The front axle is fixed, having spherical knuckles fixed to it with longitudinal flaring openings. Patent No. 670,121.

Automobile Club Directory

Under this heading we shall keep a record of the motor vehicle clubs both of this and other countries, and we hope to have the co-operation of club officers in making it accurate and complete.

*Corresponding clubs of the Automobile Club of America are designated thus *.*

Automobile Club of America, Malcolm W. Ford, Secretary, 203 Broadway, New York; representative on International Racing Board, Clarence Grey Dinsmore; Substitute, John H. Flagler.

Automobile Club of New Jersey, Secretary, Dr. H. Power, Montclair, N. J.

Automobile Club of Baltimore, W. W. Donaldson, Secretary, 872 Park Avenue, Baltimore.

Automobile Club of Brooklyn, Secretary, C. Benton Dix, Hotel Clarendon, Brooklyn.

*Automobile Club of Columbus, O., C. M. Chittenden, Secretary, Broad Street.

Chicago Automobile Club, Secretary, H. M. Brinkerhoff, Monadnock Block, Chicago.

Indiana Automobile Club, Indianapolis, Ind. Secretary, August Kabich.

Long Island Automobile Club, Secretary, Charles W. Spurr, Jr., 552 State Street, Brooklyn.

Automobile Club of New England, Secretary, Geo. E. McQuesten, Brookline, Mass.

*Cleveland Automobile Club, L. H. Rogers, 357 Amesbury Avenue, Secretary, Cleveland, O.

*North Jersey Automobile Club, E. T. Bell, Jr., Secretary, Paterson, N. J.

*Automobile Club of Rochester, Frederick Sager, Secretary, 66 East Avenue, Rochester, N. Y.

Massachusetts Automobile Club, President, J. Ransome Bridge; Treasurer, Conrad J. Ruetter; Secretary, L. E. Knott, 16 Ashburton Place, Boston, Mass.

Pennsylvania Automobile Club, Secretary, Henry J. Johnson, 138 No. Broad Street, Philadelphia.

*Philadelphia Automobile Club, Frank, C. Lewin, Secretary, 250 No. Broad Street, Philadelphia, Pa.

Automobile Club of Bridgeport, Secretary, Frank W. Bolande, 208 Barnum Avenue, Bridgeport, Conn.

Rhode Island Automobile Club, Secretary, Frederick C. Fletcher, P. O. Box 1314, Providence, R. I.

Princeton University Automobile Club, Princeton, N. J. President, P. Adamson; Secretary, Charles H. Dugro.

San Francisco Automobile Club, B. L. Ryder, Secretary, San Francisco, Cal.

Columbia College Automobile Club, Lewis Iselin, Secretary, Columbia College, New York, N. Y.

*Buffalo Automobile Club, Secretary, Ellicott Evans, The Lenox, Buffalo, N. Y.

Worcester Automobile Club, Worcester, Mass., President, J. W. Bigelow; Vice-President, Edwin Brown; Marshal, W. J. H. Nourse; Treasurer, B. A. Robinson; Secretary, H. E. Shiland.

AUSTRIA.

Budapest—Magyar Automobil Club, 31 Musem Korül.

Innsbruck—Tirolese Automobil Club, Rudolph-Strasse 3.

Prague—Prager Automobil Club.

BELGIUM.

Antwerp—Automobile Club Anverso, 34 r. Longue de l'Hopital; President, Baron de Bieberstein.

*Brussels—Automobile Club de Belgique, 14 Pl. Royale; Moto-Club de Belgique, 152 Boul. du Nord; Touring Club de Belgique, 11 r. des Vauniers.

Charleroi—Automobile Club de Charleroi, Hotel de Esperance.

Ghent—Automobile Club de Flandres.

Liege—Automobile Club, Liegeois, 2 r. Hamal.

FRANCE.

Amiens—Automobile Club de Picardie, 36 r. de La Hotoie.

Avignon—Automobile Club de Avignon.

Bordeaux—L'Automobile Bordelais.

Dijon—Automobile Club, Bourguignons Cafe Americanie.

Lyon—Bicycle et Automobile Club de Lyon; Motor Club de Lyon, 3 pl. de la Bourse.

Marseilles—Automobile Club de Marseilles, 61 r. St. Fereol.

Nancy—Automobile Club, Lorrain, Thiers pl.

Nice—Automobile Velo, Club de Nice, 16 r. Chauvain.

*Paris—Automobile Club of France, 6 pl. de la Concorde; Motr-Club de France; Touring Club de France, 5 r. Coq-Héron.

Pau—Automobile Club, Bearnais Ave. de la Pau, President, M. W. K. Thorn.

Périgueux—Veloce Club, Perigourdin, Hôtel de Commerce.

Toulouse—Automobile Club, Toulousain Café Riche, pl. St. Etienne Société des Chauffeurs du Midi, 25 r. Roquelaine. President, M. Gay.

GERMANY.

Aachen (Aix la Chapelle)—Westdeutscher Automobile Club, Hotel Grand Monarque.

Berlin—Mitteleuropaischer Motor Wagen Verein, 1. Universitatstrasse, Herr A. Klose; Deutscher Automobil Club, Liusenstrasse, 43-44.

*Deutscher Automobil Club, Liusenstrasse, 43-44. President, S. D. Herzog, Victor von Ratilin.

Dresden—Radfahrer-und Automobilisten Vereinigung; Dresdener Touren Club.

Eisenach—Mitteldeutscher Automobil Club; Motorfahrer Club, Eisenach.

Frankfort am Main—Frankfurter Automobil Club, Restaurant Kaiserhof.

Munich—Bayer. Automobil Club, 33 Findling Strasse.

Stettin—Erster Stettiner Bicycle und Automobil Club.

Strassburg—Strassburger Automobil Club.

Stuttgart—Suddeutscher Automobil Club; Wurtembergischer Motor Wagen Verein.

GREAT BRITAIN.

Birmingham—Motor and Cycle Trades Club, Corporation street.

Edinburgh—Scottish Automobile Club.

Liverpool—Liverpool Self-propelled Traffic Association, Colquitt street. Secretary, E. Shrapnell Smith.

*London—Automobile Club of Great Britain and Ireland, 4 Whitehall Court, S. W. Hon. Secretary, C. Harrington Moore.

Nottingham Automobile Club, Secretary, A. R. Atkey, Nottingham, England.

HOLLAND.

Nimègue—Nederlandsche Automobile Club.

ITALY.

Milan—Club Automobilisti Italiani 6 via Guilini.

*Turin—Automobile Club d'Italia Via Vittorio Amedeo II, 26.

RUSSIA.

Moscow—Moskauer Automobile Club, Petrowka, Hauschnow.

St. Petersburg—Automobile Club de Russe, President, M. Delorme.

SPAIN.

Madrid—Automobile Club de Madrid.

SWITZERLAND.

*Geneva—Automobile Club de Suisse, 9 boul. de Theatre.

THE AUTOMOBILE MAGAZINE

A Live Journal for all interested in Motor Vehicles

VOL. III No. 5

NEW YORK, MAY, 1901

PRICE 25 CENTS

Published Monthly by
THE AUTOMOBILE PRESS,
95 LIBERTY STREET, NEW YORK.

Telephone: 984 Cortlandt. Cable Address: "Loceng," N.Y.

ANGUS SINCLAIR, President.

JAS. R. PATERSON, Secretary.

FRED H. COLVIN, Vice-President and Editor.

JAS. J. SALMOND, Associate Editor.

BOSTON OFFICE, 170 Summer Street. PHILADELPHIA, The Bourse.

Subscription Price, \$3.00 a year in the United States, Canada and Mexico. Foreign Countries in the Postal Union, \$4.00 (gold). Advertising Rates on application.

Copyrighted, 1901.
Entered at New York Post Office as second-class matter.

For Sale by Newsdealers everywhere.

We regret that it will not be possible to publish this month the next in order of Mr. Dolnar's interesting series on the "Final Automobile." However, it is expected that in the June issue Mr. Dolnar will again favor us.

Speed of Club Runs

CLUB runs, especially in cities, should be "runs" in reality, and not races, as is too often the case. At the present state of the industry much depends on the general public, and the impression made by a dozen or twenty carriages in line, running smoothly at a moderate speed, is sure to be favorable. On the other hand, a scramble for place in line, which necessitates spurts and passing other carriages as well as all traffic, does not give the same good impression to on-lookers, and is apt to result in restrictive ordinances which are harsh and unnecessary for most automobilists.

Racing is a good thing in its place, and a friendly brush on a lonesome road or a speedway especially constructed is only natural to anyone with a particle of life or sport, but the right of others must be strictly observed in all cases. Even in country runs it gives a much better impression if the bulk of the machines arrive at their destination together, than to have them strung out along the road for miles. The inclination to let out the fast machines is naturally strong, but a little curb on this desire will probably benefit the whole motoring fraternity as much as anything that can be done.

Changes in Gasoline Automobiles

AMONG the noticeable tendencies in gasoline automobile design are the placing of the motors in front and the adoption of the tonneau body. True, some of the best machines still put motors in the rear but nevertheless the tendency is toward the front.

Each location has its advocates and its advantages. The forward motors are claimed to be more efficient owing to less loss in transmission, while this is denied by some of the others who claim that gearing direct does away with complication of parts and its attendant disadvantages.

The motor in front gives more room for luggage as most of the space under the seat is available, all the machinery in the rear being under the platform or floor of the body. This also gives room behind for extra seats in the way of a tonneau—a rumble or a regular full width seat.

The question of circulating the cooling water is also receiving considerable attention, there being many advocates of both systems. The thermo-syphon or gravity system certainly has advantages in the way of simplicity, while the pump gives one a feeling of security in the knowledge that the water is being forced through the coils—nor is this confidence often misplaced. True, pumps give trouble at times, but so does any kind of machinery.

Then the clutch problem has its own troubles, not so much in operation or mechanical details as in the question of speeds. With carriages geared for high speed's this becomes a serious problem for running at medium speed. The low gear is too low for this and with the high gear it is often difficult to reduce the speed of the motor by the throttle and spark to the desired point. This difficulty increases as the carriage is geared up and seems to point to another clutch to give intermediate speeds. This, of course, introduces a rather difficult problem in clutch design, but one that can and will be solved if found necessary.

Although there will be many changes it does not follow that carriages built to-day will not give satisfaction. That they will and do is evidenced on every hand. They are not perfect by any means, but those who keep waiting for better things never get what they have waited for and lose much real enjoyment.

The Speed Question

THREE cannot be any doubt that a great amount of the crying for reduced speed in automobiles is overdone, and is sometimes totally uncalled for. As a matter of fact, the officiousness of some of the persons who are vested with a little authority is overbearing. We have in mind now an instance of a certain automobilist who for a number of months had been in the habit of driving his vehicle through the streets of a certain crowded little city at a fairly good speed. The hack and livery people for some reason commenced to object. The city marshal thereupon warned our friend that if he ran his machine at a speed exceeding six miles per hour he would be arrested. Following this the automobilist in question found it more difficult to avoid giving trouble to people using horses. For, while formerly he had passed in a moment, before the horses had time to find out whether horses were ahead or not drawing the automobile he was now obliged to slacken his speed and practically creep behind, irritating the animals, and giving them ample time to find out what was coming. This is oftentimes the case, and the sooner an automobile can get ahead of a horse when traveling in the same direction the sooner the danger is past. The instances where horses have taken fright when passed from behind at high speed have been very few indeed.

The fact of the matter is, much of the legislation restricting the speed of automobiles now rampant is, to say the least, very unreasonable. Perhaps it would be a good thing if some of our officials looked to it that horse-drawn vehicles did not exceed the limit set by law.

Private Touring Parties

THAT much pleasure can be gotten out of a tour in an automobile is well known to our readers. Now that the automobile is coming into more general use and summer is approaching arrangements for tours in motor vehicles are being made. What could be more delightful than to have say four or five horseless carriages filled with parties skimming along the country roads of some picturesque part of our country. This kind of touring presents greater opportunities to take in the surrounding scenery than does touring on wheels—calling for no exercise or caution on the part of the occupants of the carriages. Should particularly pretty scenery present itself,

then a reduced speed can be given the vehicles, thus permitting the party to enjoy it, while if a barren stretch looms up increased speed can be made. No horses to grow tired or go lame. There would seem to be no good reason why any four or five owners of automobiles could not make up such a party and get a great deal of real enjoyment and healthful recreation out of the occasion.

There is one point, however, in connection with such an arrangement upon which would depend much of the pleasure, and that is the choice of companions. Unless those who participate are people sufficiently well acquainted to make concessions to one another's wishes there will be continual clashing. No effort should be made to race.

Before starting on a tour of this kind the route should be carefully marked out, although it is not advisable to fix arbitrarily the distance to be covered each day or places where halts shall be made. The ideal way is just to start out and allow experience to dictate where you should stop. If you lay down too straight rules much of the enjoyment will be taken out of the tour. When it comes to the laying out of routes, road maps may be consulted, and in their absence railroad maps, which are sometimes found to be good substitutes.

It is hard to conceive of a better way for a few mutual friends to enjoy themselves than that suggested. If a camera or two are carried these would add materially to the enjoyment of the tour. To take such a tour involves time and expense it is true. Nevertheless, it gives one all the pleasures of the bicycle tour without the work, and is an ideal way of seeing the country.

Work of the National Good Roads Association

THE National Good Roads Association has just issued the first number of a monthly journal devoted to the interests of good roads. It is issued from 928 Marquette Building, Chicago, and costs but \$1.00 per year. The latest move of this most useful organization is worthy of mention. It has made arrangement with the Illinois Central Railroad for a special train composed of six flat-bottomed cars. This train will carry engineers, road building machines as well as representatives of the Good Roads Association. It is proposed to build at fifteen or twenty points one-mile sections of good

road. These are to serve as object lessons to legislators and farmers. A convention will be held at the close of the work at these several points. This is a most laudable move, and it is expected and hoped that much good will result from it. It is also rumored that other railroads are prepared to follow suit.

All automobilists ought to be in sympathy with the work being done by this body, and we bespeak for it the support it deserves.

A 260 Mile Run with Three Small Motor Carriages

By S. F. EDGE

A FEW days ago three of us, to wit Charles Jarrott, Cecil Edge, and the writer, received an invitation from Mr. Wilkinson, honorable secretary of the Lincoln Automobile Club, to attend their annual dinner on March 16. At the time the invitation was received the weather looked more Spring-like, and we arranged to all go down on fast De Dion tricycles, two of 6 horse-power each and one of 8 horse-power, but as the day approached the weather seemed so unkind, cold with passing showers of sleet and rain, that one and all began to think that some motor vehicle in which one could be well wrapped up in fur robes would add to the enjoyment of a spin of nearly three hundred miles. A consultation therefore on the Friday morning was held, and we decided to all go down on separate vehicles, so that the London contingent would seem more imposing, and the vehicles we decided to use were : C. Jarrott on his Liverpool trial-winning De Dion voiturette, C. Edge on a brand new (in fact, the first of its kind) $6\frac{1}{2}$ horse-power tonneau, Gladiator, and the writer on the new genuine Panhard & Levassor 5 horse-power new light carriage that created such a sensation in the Paris show. The driving of this appealed to me in many ways. In the first place, I was the first to drive one of these carriages in this country, and outside one or two members of the great French firm, the first to drive it at all, as so far two only have been turned out of the works, although many hundreds are in course of construction. Secondly, as I had not driven a small horse-power autocar for some months it would be interesting to see if my recent long course of high horse-power had spoilt my enjoyment

for the humbler vehicles. So on Friday afternoon it was decided we should start and go as far as Hitchin, so as to have only about one hundred miles to do on the Saturday and thus enable us without early rising to arrive in Lincoln in good time for the dinner.

However, business prevented, as it was not until nearly 7 that we went steadily away through Regent's Park and Hampstead to Barnet. Just before reaching the latter place, however, the large acetylene lamps with which the Gladiator was fitted so that we should be able to travel by darkness as well as by day, went out, and no amount of persuasion would make them stop alight over the smallest depression in the road. After about the forty-fourth relight, it was suggested that Jarrott push on to Hitchin and order food, while we came quietly on with one small oil lamp apiece through the pitch black night. So far, with the exception of the lamps all had gone perfectly, but during one of the many stoppages to find out why the lamps, usually so good, failed on this occasion, I thought this a good occasion to see how the Panhard went with tube ignition (so far I had been running on electric), so I lighted the lamps and restarted the motor and off we went, when a few miles from Hitchin suddenly the motor stopped with a gasp or two, and down I climbed to see what was wrong. I found both lamps just expiring, so without further investigation I switched on the electric and away we went to Hitchin.

I found on examination in the morning that the petrol pipes leading to the lamp had not had the connection screwed up, so that the petrol had not only fed the lamps, but also fed the road to such an extent that a few miles exhausted the petrol supply in the lamp tanks. However, we found Jarrott safely at the Sun Hotel with a late dinner ready for us, most acceptable after the bitter cold outside. After this, noticing electric light in the hotel, I thought that possibly as this was a new car the accumulators might be feeble. I enquired as to the source of the electric power and finding it was manufactured on the premises I asked if my batteries might be put on to charge until morning. The landlord informed me that the electrician was out and that he himself at this hotel had never had any experience with the charging plant, but that he was quite agreeable to my seeing what could be done. So down we both went to the electric room and there to my pleasure found a regular charging board installation, with a lamp in circuit to give the necessary resistance, so here I left my batteries connected up all night, secure in the feeling that all would now be certain in the electric department of the Panhard.

The next morning all were up in good time, cars looked over, and lubricators filled, and away we went in a steady drizzle to Biggleswade, where we had decided to replenish all our petrol tanks at the obliging Dan Albone's. We soon reached here at a speed duly up to limit, and soon away again with the idea of having lunch at Peterborough, some 35 miles away. After going 15 miles, a little north of Buckden, Jarrott's De Dion suddenly stopped. A search round found the presence of a lot of red grit in the carbureter, evidently the fruits of pouring in petrol without straining it through a gauze funnel. Thanks, however, to Monsieur Bouton, with his clever device, the carbureter was to pieces in about 30 seconds, the offending particles of dirt removed, and in two or three minutes we were off again. Then the long climb up Alconbury was reached, all the cars taking this pretty stiff gradient at a speed well up to the legal limit. Then a glorious run down the other side and steadily away over a rather bumpy road to Peterborough, the only incident being the meeting of four horses harnessed to a heavy farm wagon with the driver fast asleep, and who did not wake up until the horses had turned the cart completely round, and pulled it to the side on the grass, his head then appeared and he waved a smiling adieu to us. His good temper was, I fear, an imbibed one.

At Peterborough after a call at the telegraph office it was decided to push on to Bourne for lunch. However, on this stretch a little delay befell us, the radiator on the Gladiator car sprung a small leak at the bend ; however, a turn with the spanner soon set this to rights, and away we all went until just as the entrance to Bourne was reached a man came into the middle of the road and said "Stop!" Visions of police and other unpleasant subjects came before us, but on stopping all we were asked was, "Are you going to have lunch?" This seemed a strange query, but feeling that way and to humor him we replied that we were, and then more astonishing words were said : "All right, come in ; it is all ready." After this it seemed evident to us some explanation was needed, as it appeared we were being taken for somebody else ; but no, it appeared that Dr. Gilpin, a member of the Lincoln Automobile Club, had arranged to have lunch ready for the London visitors, but owing to some mistake on the part of the General Post-office no advice to this effect had ever reached us, so that our decision to push on to Bourne for lunch was merely providential, for here were we taken in and treated right royally, and at this point let me thank Mr. and Mrs. Gilpin on behalf of the trio of cars, for their kindness to men and cars.

Inquiries elicited the fact that Dr. Gilpin was a motorist to the extent of already having petrol on the premises, and a car on order. "May they soon join our allied forces," was our toast and his. Time was still moving on and some thirty-odd more miles to be done before Lincoln could be reached, so with good-bye to Mrs. Gilpin and a promise not to endanger the life of the doctor, he climbed into the vacant front seat of the Panhard.

On the way from Bourne to Sleaford I explained to the doctor how simple motors were when one was used to them, how good they are, now giving him, for example, the car he sat upon being taken straight from the crate it arrived in, just being filled with oil, petrol and water, and launched on its journey of nearly three hundred miles and so far not a single thing had required a moment's attention. However, just as we entered Sleaford a pop was heard, and on getting down one of the back tires was found with a large stone through the outer cover, and this caused a puncture in the inner tube. There was nothing to do but repair it, and this was done with the assistance of the doctor and Jarrott, who here caught us up again, having got behind through missing his road a few miles further back. We were soon away again merrily on the way to Lincoln, but I found the motor did not seem to be pulling quite as well as formerly, appearing to miss at times on one cylinder, then coming to an extra sharp rise a few miles out she almost stopped. This made me think it best to see what was the trouble. A glance inside the bonnet soon showed what was wrong—one of the valve lifting rods had moved out of place and the front exhaust valve was lifting intermittently. This was quickly placed in position, and the spring given an extra pinch to make certain it would not occur again. By this time the punctured tire seemed somewhat slack, but I thought an application of the pump would enable us to run into Lincoln without further trouble, but this was not to be, as at the top of the Lincoln hill I found the tire quite flat, so down the doctor and I jumped, and off with the outer cover, in with a new air tube, rapid work at the pump, and away merrily into Lincoln, the motor seemingly extra strong, then to find a nice place for the good little car, a dash of paraffine for the cylinders, to make sure all would be free and clean for the morning's start, and then a rush for dress clothes and the other details requisite to attend the Lincoln Automobile Dinner. This was a great and successful function, and then to bed with the idea of an early start, so that we might comfortably traverse the 130 miles which separated us from home. However, the early start

was not to be. The Panhard was ready and waiting to be taken out at 8:30, but a friend's voiturette was cross, the ignition trembler had got bent, and the screw that held it rusted in, so that a long hour was spent in endeavoring to either bend this in place on the car or remove the screw.

This was, however, unavailing, so that the trembler was bent, with much fear for a fracture, to its correct position, then all was peace, and away we all went straight for London town. The first stop was at Bourne, to say good-bye to our friend Dr. Gilpin; the next at Peterborough for a late lunch, then away to Biggleswade, where the other cars took liquid refreshment in the form of petrol, and straight through to London without a stop, and this ended the christening of the latest Panhard and Levassor model carriage—a run of 260 miles with the car straight from the maker's crate, on the outward journey one puncture, and one small spring misplaced on the homeward journey, not even a misfire to mar the harmony. On the outward journey electric ignition was used, on the return tube ignition only.

The J. H. Lancaster Company, of 95 Liberty Street, New York, has just received an order for several omnibuses for service between Northport and Oyster Bay, L. I. The vehicles will each seat fourteen passengers and will be fitted with two eight horse-power motors. In our next issue we will give illustrations showing the construction of these 'buses.





Prof. Thurston on the Gas Engine

AT the February meeting of the American Institute of Electrical Engineers, Mr. W. J. Hammer quoted the following letter written by Prof. R. H. Thurston in reply to a request for his opinion as to the relative efficiency of steam and gas engines :

"The best work, to date, is practically the same for both engines. Each has delivered the net horse-power with a consumption equivalent to about one pound of good coal. The consumption of such fuel for efficiency unity would be about one-fifth of a pound per horse-power, and these engines have thus both attained an efficiency, between the coal pile and the point of delivery, of about 20 per cent.

"The steam engine has attained so nearly its limit that further progress under commercial conditions would seem to be likely to be hereafter very slow and to be dependent mainly upon the possibility of increasing the thermodynamic efficiency by extending the thermodynamic range of working temperatures. In the steam engine this range may be increased either by still further increasing the working pressure at the boiler or by superheating the steam or by both expedients combined. Higher pressures are coming to be available, with progress in the construction of high pressure, presumably water-tube boilers, and we have, in Sibley College work, employed over a thousand pounds without special difficulty, and I have little doubt that we can quite as well, as did Perkins two generations ago, use pressures of 2,000 pounds and probably more. We are now beginning to find practical methods of construction and use of superheaters for ordinary pressures, and I have little doubt that we will be able to superheat steam of those higher pressures in course of time. These improvements should permit the increase of efficiencies by something like 50 per cent. and bring the consumption of fuel down to three-fourths of a pound of good fuel per horse-power hour, and perhaps within the next generation, if not within ten years.

"I am not prepared to say what should be hoped for with the gas engine; but the indications at the moment would seem to be that, as

we have a very much larger opportunity to reduce wastes that now characterize the gas engine than to extinguish those affecting the steam engine, more should be expected from the coming years with the former than with the latter. The gas engine has only now come to be a formidable rival of the steam engine and is gaining upon it rapidly. The deduction seems fair, therefore, that the next few years should see the gas engine so much improved as to permit it, for many places and purposes, to become a successful rival. In some directions, as at sea, in the locomotive, and perhaps in some other departments, it is possible that steam may continue to hold its place unchallenged, but this is by no means certain.

"It is unquestionably the fact that to-day the gas engine is steadily overhauling the steam engine and as steadily displacing it in many directions. I think it extremely possible that it may ultimately displace it very largely, but I think that the steam engine is likely to hold a place among economically available prime movers for a long time to come, and no one can say what may be anticipated to follow its further improvement by effectively combining a maximum range of pressure and a maximum range of coincident temperature, the one giving maximum mechanical efficiency and the other maximum thermodynamic, the combination yielding what is the main object of selection in practically all cases—production of power with minimum costs on all accounts, production of power with least reduction of dividend-paying capacity."

The Question of Complication

A RECENT conversation with Mr. Gallaher, manager of the Searchmont Motor Company, brought out a very clever point made by him in discussing the question of complication with a physician who was looking at a carriage with the view of becoming a purchaser.

He was shown one of the carriages and remarked on their simplicity until he came to one with the casing removed from the motor so as to expose the working parts. Then his mind changed, and he exclaimed as to its complicated mechanism. The reply in substance was as follows :

"Doctor, we believe that motor has as few parts and as simple parts as will run and give satisfaction. A certain number of parts are

necessary in every machine. - If you hadn't seen it with the covers off you would still think it the most simple machine made. You're a doctor—now to you the human body is a simple machine. So it is to anyone when it's whole and has all the skin on. But under the skin are nerves, muscles, bones, heart, lungs and a lot of other machinery that makes our motor the acme of simplicity in comparison. You're used to the one—we to the other.

"The human machine wouldn't run with many of its parts gone—removing any of them impairs its efficiency. It's just the same with a motor and the question of complication depends largely on what we are accustomed to. The motor with only part may come, but it hasn't arrived yet, nor is it likely to this year."

It strikes us that this contains more good, common sense than we usually find in a short argument. It applies equally well to any good carriage made.

Employment of Alcohol in Automobiles

COMPETITION AND TESTS UNDER THE DIRECTION OF THE
MOTOR CLUB OF PARIS

THE competition that occurred at the close of October last was a great success in the number of vehicles that took part and in the wide-spread interest and discussion that were excited during the period of suspense awaiting the awards of the committee. The delay in the reports was principally occasioned by the necessity of using several months for the examination and analysis of the alcoholic mixtures employed. The result has not been a success in uniting the opinions of experts on the measure of the value of alcohol as a motive power. That exact value will doubtless be fixed by further tests. The following extracts were translated especially for THE AUTOMOBILE MAGAZINE, and present some phases of this interesting trial :

Résumé of the Report of M. S. Amiot, Official Reporter of the Commission—

Great interest was felt in the test by the general public, the Government, and, in particular, by the agricultural societies and instructors. Sixty-two competitors responded to the appeal of the Motor Club ; forty-eight took their departure from the Porte-Maillot ; forty

made the run within the prescribed time. The elements of the contest included :

1. The consumption of alcohol employed as a motor force.
2. The consumption of alcohol employed otherwise than for a motor force (as burners, etc.).
3. The chemical composition of the alcohols and mixtures.
4. The operation of the motor and the regularity of the run ; all speed greater than 30 kilometers (about 18 miles) per hour in the level country and 20 kilometers (12½ miles) where rough, not being taken into account. Vehicles, of whatever kind, were required to have at least two seats, of which one was occupied by a member or representative of the commission. Gaged reservoirs and weighed vehicles.

It is proper to assign the prizes according to these several data, and for this purpose to adopt a simple formula, embracing all the elements.

The consumption has been adjusted by the total gross weight (carriages, travelers and appurtenances), with the expense of the combustible. The number of kilometric tons obtained with a liter of liquid for each vehicle having been calculated, 10 points per kilometric ton are assigned as a result.

Thus we have the formula: $10 \times \frac{P \times 127}{C} = A$; P being the rough weight in tons, C the total consumption in liters, 127 the distance of the course in kilometers, 10 the points assigned per kilometric ton, A the corresponding coefficient.

The composition of the liquid was judged by assigning one point per 1 per cent. of alcohol contained in the liquid, or 100 points for pure alcohol ; the use of the latter being regarded as the most important.

An average of 23.225 kilometers an hour has been considered as corresponding to this rule, and 116.12 points were assigned for a speed equal or superior, over the entire course ; stops due to some unusual obstruction to motor or carbureter being deducted from the time, but a reduction of one point a minute being made for a stop due to motor or carbureter.

According to these results the prizes in money have been awarded ; the medals having been assigned partly for the least consumption (the highest yield in kilometric tons per liter), partly for the greatest

speed; finally for liquids the richest in alcohol and for service rendered.

Résumé of the Report of G. Arachequesne, Member of the Commission, on the Physico-Chemical Tests—

The large number of samples furnished, which were analyzed by M. Sorel, and the difficulty of working upon so many products in small quantity has caused delay in the report.

Under the circumstances, the composition of the mixtures has been called for from those who compounded them, as well as an additional quantity of liquid. Tests for verifying, rather than analyses properly so called, have been made as follows:

1. Separation of the alcohol from the hydrocarbons by three successive washings with water saturated with sea salt.
2. Distillation of the wash waters to determine the degree of alcohol employed.
3. Ascertainment, as complete as possible, of the nature and of the quality of the hydrocarbons employed.

The variations between the results of the analyses and the verifications have never exceeded $1\frac{1}{2}$ per cent., which is not excessive, considering the residues of gasoline found in the reservoirs on one hand, and the very great expansion of alcohol on the other—an expansion which for a difference of 10 degrees in the temperature amounts to almost one per cent.

LIST OF THE AWARDS.

	Francs.
1. Le Blon (voiture No. 20 Bardon),	1,000
2. Gobron-Brillié (voiture No. 3 Gobron-Brillié),	500
3. Charron, Girardot & Voigt (voiture No. 36 Panhard-Levassor),	300
4. Gobron-Brillié (voiture No. 18),	200
5. Bataiellée (motorcycle No. 37, Bataiellée),	100
6. Vilain Brothers (voiture No. 14),	100
7. Martha (voiture No. 18 Dietrich, carbureter Martha),	100
 Total prizes in money,	 fr. 2,300

ADDITIONAL REMARKS BY G. ARACHEQUESNE, MEMBER OF THE COMMISSION.

It should be noticed that there was no special classification of vehicles or motorcycles, and no classification of the liquids employed,

provided they had alcohol for a base. It was suggested that so far as possible the carbureting material should be of French production, or the residue of French factories.

Although the strictest injunctions were placed on competitors to avoid all fraudulent mixtures, more than one hundred samples were reserved by the commission to submit for chemical analysis. Also, at the request of M. Jean Dupuy, Minister of Agriculture, and M. Vassilière, President of the Commission of Denaturalized Alcohols, the analyses of all these samples were intrusted to M. Sorel, chemist and reporter of the above commission, which is a full guarantee of accuracy.

The results are decisive in certain respects, since the majority of the competitors made the run from Paris to Rouen with a speed not less than in preceding competitions of gasoline over the same course. Some of the competitors, by running with denaturalized alcohol alone, have proved that the alcohol motor is not a fantasy. And the large number employing alcohol carbureted by French benzines have proved that it is possible to contend on an economic basis with foreign gasoline, whose scarcity was a menace suspended over automobilism.

It still remains, however, for French engineers and constructors to replace the old theories, the old formulae, by others more conformable to the facts ; then to draw from them numerous improvements for future motors.

To arrive at this result, it is necessary to proceed with new trials upon motors of different models, in order to be able to ascertain the power of the expansion produced by alcohol, alone or carbureted, and the means of utilizing this expansion under the most advantageous conditions.

Notwithstanding the great success attained by the advocates of alcohol, we should not sleep on our laurels and consider the battle as completely won.

Recent visits to the factory of the De Dion-Bouton Motorette Company found them rushed with orders and many still on the waiting list. There are several modifications in the styles of bodies for this year, some of which we shall illustrate a little later. There are a number of five horse-power machines under way, and a few of even higher power. The latter will have the motor in front and make use of the justly popular tonneau body.

A Combination Truck

By H. M. UNDERWOOD

THE question has been asked many times as to which power is the best to use in automobile construction, for the general lines and body have nothing to do with the general operating of the vehicle from an economical point of view, though they may affect the general cost of construction.

I doubt if at the present time there is an automobile on the market which is, in the minds of everybody, absolutely free from faulty construction. One person will tell you the system of guiding this carriage or that one is not, in his mind, the proper method, another will say that he prefers steam instead of gasoline or electricity, while another would not consider anything but an electrically operated carriage, while the man who has had some experience in the handling of gasoline, would not consider for a moment any other system of power. In fact, each one has his own idea and is very pronounced in his views on the subject.

Now let us put two of the minds together and endeavor to bring out more clearly, and if possible, to a high and technical standard, that which has heretofore been in general practice. While each of the three systems above referred to, viz.: Steam, gasoline and electricity, may have in themselves some drawback, and we will say a drawback to the layman in general, would it not, to a great extent, be the means of righting this grave difficulty if we were to tandem two of the present methods and make one system, which would not only be the means of simplifying, but multiply the power of one individual vehicle, and at the same time eliminate the danger of getting stalled when out for business, for we must all acknowledge this branch of the automobile industry is to-day fast coming to the head, particularly for heavy teaming.

Many manufacturers have been striving for years to bring out and place upon the market a wagon which can be relied upon at all times, no matter how heavy the road may be or how steep the grade to be climbed. But not until recently has one been manufactured that fulfills all the daily requirements which it is called upon to perform.

Necessity is the mother of invention, and with this fact constantly in mind, we can positively state that among the many attempts to

overcome these various defects, which each one of us professes to see when looking at various makes in gasoline and electricity as a motive power for automobiles, what appears to be one of the most practical is the system and method employed on the Fisher autotruck, which has been in use for some time and has been seen running on the streets of New York City.

The fuel or prime source of energy is gasoline. The 12 horse-power thus generated is, by the application of a dynamo connected directly through the armature shaft to the shaft of the gasoline engine, transformed thereby into electricity, which is stored in batteries located beneath the bottom of the floor of the wagon. To each rear wheel is geared a 7.5 horse-power motor which is guaranteed to stand an over-load of 100 per cent. for a period of one hour, and will for a short time, in case of emergency, develop 30 or 40 horse-power.

The connections from the dynamo are such that the current is delivered direct to the motors, but when coasting down grade or while slowing up, or in general when less power is required than is furnished by the engine, the surplus current is automatically taken care of by the storage batteries, which are connected to the wiring at a point between the dynamos and the motors. It can therefore be seen that when more power is needed than that furnished by the engine, the batteries are cut into the circuit and make up the deficiency.

The principle of this combination is to overcome all the defects of either power taken alone.

As the charging of the batteries is accomplished by the machinery carried, the range of travel is far from limited as to any specified distance from the power station as in the case of a purely electrically operated vehicle, and therefore any passable road may be easily traveled. A series parallel controller is employed, and any speed from a maximum down is obtainable, either forward or backward.

The continuous operation of the gasoline engine effects a great saving in gasoline while obtaining maximum results; also prevents to a great extent the usual bad odor by having better combustion.

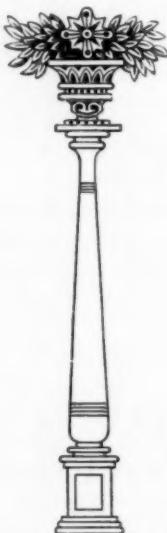
It is not necessary to use a governor as the load is always the same, and as the speed is practically constant the engine can be perfectly balanced, preventing all vibration. The ease with which the engine can be started is very marked, being accomplished by means of a switch connected to the storage battery circuit, thus saving the great annoyance generally found in many makes of the ordinary gasoline engines.

The weight of the machinery is not as great as might at first glance be supposed, the engine being much smaller than what would be required to operate the vehicle if the power were gasoline direct. It has been found that the cost of operating is about $2\frac{1}{2}$ to 3 cents per mile on an average road. These trucks will weigh from three to four tons, and are capable of being loaded to from five to eight tons, some being large enough to carry as high as ten tons.

As to the grade climbed this is about the same as that of a similar wagon drawn by horses and a much greater speed can of necessity be maintained under all conditions.

As a general thing in this class of trucks when drawn by horses the mileage is about six miles per hour, while this combination auto-truck can make from nine to twelve miles per hour.

It will be readily seen that with this powerful class of truck stalling is practically unheard of, and there is every reason to believe that the general adoption of this Fisher autotruck will gradually become one of the leading equipments on the streets of our large cities throughout the country.



The Gordon-Bennett Race

THE Gordon-Bennett Cup Race is the star event of the automobile world. It is international in scope, and naturally those countries which decide to enter competitors make great efforts to have the representatives most thoroughly qualified.

It is now definitely decided that this country will not send any representatives, yet some account of what the Automobile Club of Great Britain and Ireland are doing toward making a wise selection of competitors may be of interest. The races committee of that club for the purpose of determining which of the competitors shall be selected to represent the United Kingdom in the race, will arrange a trial of each of the vehicles over about 100 miles of road in France. An observer appointed by the committee will be on each of the cars during its trial. The races committee, after receiving the records and reports of the observer, will select the three cars. The trials will take place within a fortnight of the date of the race. The competing cars must be in Paris at a place to be hereafter named by the committee, and must be prepared to undergo the trial on and from Wednesday, May 15. In the event of only three vehicles being forthcoming at the eliminating trials, the races committee need not necessarily agree to all of these vehicles competing in the Gordon-Bennett race, but may select one or more of the three as may seem best to the committee.

The races committee reserve to themselves the right to nominate in addition to the three selected competitors a reserve competitor, and to substitute the reserve competitor for one of the selected competitors even at the last moment, without giving a reason, and competitors are required to abide by the decision of the committee in this respect.

In view of the rule which stipulates that the competing cars shall be entirely, and in respect of all their parts, constructed in the country which they represent, the races committee will not allow a vehicle to compete in the eliminating trials unless the owner is able to produce a written certificate by the makers that the vehicle is, as regards all its parts, constructed in the United Kingdom; further, the races committee will not accept a vehicle for competition in the eliminating trials unless an inspector, to be appointed by the club, shall be allowed to inspect every portion of the vehicle during and after its construction.

Competitors will make such arrangements as they think proper on the road for the supply of petroleum spirit and spare tires. The races committee will endeavor to provide a building in or near Paris in which the competing vehicles may be stored from the 15th of May until the start of the race.

In view of the great physical strain which will be involved by taking part in this race, and of the fact that the competitors will be representing the United Kingdom, the races committee require that competitors shall agree to abide by the rules and directions of the races committee concerning their personal training, of their mechanicians, during the week immediately preceding the race. Competitors and mechanicians will be required to agree to live under the supervision of a member of the committee during that week, and to abide by the instructions of the committee as regards the hour for retiring to rest, regularity in taking meals, etc.

A recent visit to the works of the Riker Electric Vehicle Company, Elizabethport, N. J., revealed a busy condition of things. They were getting ready to ship several carriages to the Pan-American Exposition. It is expected that this company in conjunction with the Electric Vehicle Company, will exhibit about thirty carriages. Just at the time of our visit they had finished a very satisfactory test of a new gasoline motor. This is a two-cylinder engine having water jackets cast solid with cylinders. The cylinders are 4 x 4 inches and running at 850 revolutions per minute give 9-brake horse-power. The engine is very compact and extremely easy of access. In order to get at the crankpins it is only necessary to remove an aluminum case. These motors will be made in two sizes, 8 horse-power and 16 horse-power. The carriages on which they will be used will have a tonneau body, a type which is gaining much favor both in Europe and America. This will be detachable. It is now about one year and a half since Mr. Riker began to work on the designing of a gasoline engine suitable for automobiles. There is one excellent feature about the carriage and that is the ease with which it will be possible to get at the working parts. The motor will be mounted on the front under a suitable bonnet. There will be a chain drive on each of the rear wheels. There have already been placed orders for fifty of these machines by July 1.

Practical Operation of a Steam Automobile

MAURICE B. THAYER

HOW long will it take *me* to learn to run an automobile? is one of the first questions of the prospective buyer. If a purchaser is assured that a lesson of from two hours' to half a day's duration will give him full mastery of the new art, is it surprising that after becoming an owner, and passing through many unfortunate experiences during the first month, he is inclined to a mild cynicism as regards the roseate stories of salesmen and catalogs?

While much information which is given to an intending purchaser is recognized by the initiated as harmless banter, it cannot help but have a discouraging effect upon a man as he afterwards discovers that an automobile is only after all a "machine," and must receive, as such, some care and attention to get good results. A great deal depends in first starting correctly and understanding your machine thoroughly. In this respect, I may say, that "some are wise, while many are otherwise." A new operator finds it exceedingly difficult to restrain himself from "flying," while he is young at the business, and as he is not only breaking nature's laws, but the country's, misfortune nearly always awaits him. It is true enough that one can acquire control of his machine in a lesson of a few hours, and would doubtless be able to keep in the middle of the road, but when it becomes necessary to share that haven with a passing vehicle, there is often an unaccountable attraction in the wayside ditch or telegraph pole. The small, though important things, which bother the new operator of a steam carriage, such as the regulation of the water supply and the fire, become, in time, second nature to him.

Mechanical experience, though helpful, is not necessary to complete success, as results have shown. To the man who is willing to spend a week at least in getting acquainted with his machine in all its practical details, most of the annoyances on the road, due to minor faults, are spared, or can be remedied in short order. If I can help new or prospective purchasers in a way to prevent those annoying stops by the roadside, the object of this paper is attained. The art of automobiling cannot be acquired by the help of a list of rules alone, as each operator must depend largely on his own experiences to be-

come an expert chauffeur. Experience is a slow teacher, and the learner is always glad to receive practical help.

Do not attempt to make long trips until you become thoroughly competent to operate your machine under trying circumstances, or until you have tested your nerves under stress of excitement. In starting out it is advisable to observe as much routine as possible. Learn from practice just which way each valve turns, as you may sometime wish to close one in a hurry. Never start out without a full supply of water, and never wait until you are out of the same before looking for more. A burned out boiler, so-called, is always due to carelessness, and it is a saying that every man will accomplish this feat once, and in most cases only once. The true level of the water in the boiler, as indicated by the water glass, should always be made certain before "firing up." A full water glass does not necessarily mean a full boiler. If the water glass is showing a true level, opening the lower valve of the water column will cause the water to run down in the glass, or in case the water is in sight, simply tilting the machine by putting the foot on the step will cause the water to vibrate up and down in the glass.

In regulating the supply of water in the boiler while running, a happy medium may be reached by adjusting the "bypass" part way open. To be on the safe side the novice should run with not less than a half glass of water indicated. Often in first starting your machine, it is necessary to move slowly backward and forward, to remove the water from the cylinder of the engine.

Through the incompetent handling of the throttle much power can be wasted and likewise water, which becomes valuable simply because one dislikes to stop and refill the water tank. Do not clutch the throttle as if it was a gate post; by placing the hand palm down with the throttle lever extending between the thumb and forefinger, a perfect and close control is obtainable. The throttle should never be opened to its fullest extent, as the steam reaches its highest efficiency at a certain point, beyond which much live steam passes through without being utilized. Skill in starting or stopping quickly at a critical moment is a matter of practice. The experienced operator learns to watch the steam gage and water glass mechanically, thereby marring his pleasure very little.

It is always safe to relight the fire when you have thirty to forty pounds of steam, but care should always be taken first to let out any condensed gasoline, by opening the torch valve.

A quick drop of the steam pressure usually means that the fire is out from lack of fuel, or has been blown out ; this is also an indication that the boiler is dry, in which case the fire should be turned out in short order. The best results are obtained by running under a high pressure of air of not less than thirty-five to forty pounds. With this air pressure not more than one and a half turns of the gasoline valve supplying the burner are necessary to keep up a good pressure of steam.

As soon as an operator overcomes the first difficulties his most natural ambition is to run economically. From a failure to grasp a knowledge of how to get the best results out of given conditions most of the criticisms of the catalog stories arise.

It is the tendency of the unsuccessful operator to blame the carriage for faults lying entirely within himself. The engine is the most vital part of the machine and it often receives the least attention. Do not be afraid to be liberal in the use of oil. Do not emulate the mistake of a Philadelphia owner, who ran his machine without filling the cylinder oil cup, thinking that that operation was done at the factory. This party had complained for some time of a squeaking noise which he could not understand. As a result of his carelessness it was found that the piston stuck so fast that it was necessary to remove the cylinder head and by means of a sledgehammer drive it out.

The boiler should be blown off at least once a week to keep it free from sediment. The operator's success must still depend upon his own willingness to investigate trouble as it comes and so make that difficulty an impossible source of annoyance ever after. A few minutes can be spent most profitably inspecting the various parts of the machine before starting on a ride, and I would advise jacking up the rear wheels and running the engine, in order to locate any foreign knock or rattle. To go still further, the successful must have nerve but not nerves, if so close a distinction may be drawn.

To the man who does not know from actual experience, I may say that there is no present enjoyment quite equal to flying through a fine country in a steam automobile.

About Motor Cycles

THE use of motor bicycles and tricycles is increasing, and it is certainly not such a difficult matter to operate one of the first named machines as at first appears to the average person. To be sure there are a number of little things to watch, yet there seems to be no good reason why a person who has been accustomed to ride an ordinary wheel, cannot with very little effort successfully operate a motor bicycle.

In this connection we reprint an abstract of a contribution Mr. A. J. Wilson made to the *Autocar* recently. The writer has had long and varied experience as a motor-cyclist, and is looked upon as an authority upon matters connected with self-propelled bicycles. He said :

"Up to the present I am not enamoured of free engines for motor cycles. My experience may have been exceptionally unlucky, but it has been so uniformly unsatisfactory that I fear it may be typical of a large percentage, if not of the majority of cases.

"As fitted to the De Dion, the manipulation of the extra lever which is requisite to put the engine in and out of gear with the road wheels is a simple matter enough to anyone who has become *au fait* with driving the standard type of motor cycle. When about to start you pull a lever—exactly like a brake lever—half-way up toward the handle, and a spring-controlled thumb lever then engages it and holds it in position. (If you pull the lever quite up, it applies the brake.) You then pedal, and instead of starting the machine forward you only start the engine. Having found your mixture in the usual way, taking care to retard the sparking, you grip the two levers in your hand, the thumb lever releasing the clutch lever, and you then, very, *very* slowly let the clutch lever down so that the clutch gently engages, connecting the engine to the road wheels, and away you sail.

"If you let the clutch lever down at all quickly, the clutch engages so suddenly that the engine jerks the driving wheels forward violently, and you run the risk of being tipped over backwards.

"If the engine be driving light, with a minimum of gas, it sometimes stops directly the clutch engages, and you have to begin all over again.

"The best plan seems to be to give the engine as much gas as you would give it for a pace of, say, ten miles an hour, and before applying the clutch put your brake on. This will prevent the driving wheels

starting forward too suddenly, and the moment you feel that the driving has commenced you can gradually release the brake. But if you do this with the sparking retarded and but little gas, the engine may fail to start the tricycle at all. It is a tricky business altogether.

"Even with a clutch perfectly adjusted, I would not advise a beginner to use a free engine motor cycle, but would recommend a novitiate upon a standard machine without this complication. When the free engine cycle is first tried the rider should not attempt to use it in traffic, but should forget that he has such a thing, and drive solely by the usual method of switching the current on and off, and pedaling, until he has experimented on clear roads sufficiently to familiarize himself with the peculiarities of the contrivance.

"If you give me my choice of a water-cooled cylinder head and a free engine, I would unhesitatingly select the former. Water-cooling is unquestionably a great advantage. On a two and three-quarter horse-power De Dion tricycle I tried to heat the engine by rushing it down some miles of gentle decline with a surface of dense, sticky mud, and thence up a mile of steep hill. It took the hill at—well, quite up to the legal limit, whereas an air-cooled engine would have been distressed half-way down the muddy descent, and would probably have refused the hill at all.

"When traversing streets where there is much traffic it is very irritating to have to be continually altering the positions of the levers to suit the pace to various exigencies. The best course is to retard the sparking for the slowest pace, and advance the gas supply for the fastest, leaving them so, and holding the machine back solely by means of the brake.

"Perhaps the brake will unaccountably fail to retard the momentum, even when the lever is gripped tightly. If you carry your cyclorn, or hooter, on the same side as the brake lever, the cause may be discovered in the cyclorn having shaken down, so that it interferes with the lever's range of movement. Carry the horn on the opposite side to the brake lever, not only to prevent such fouling, but also because you frequently require to apply the brake simultaneously with sounding the horn, and you cannot do both with one hand."

Mr. E. H. Cox, A. M. I., M. E., who for the past five years has been with the De La Vergne Refrigerating Machine Company, recently resigned.

The Doughty Bill

THE Doughty Bill recently introduced to the Albany legislature passed the Assembly unanimously. The Senate, however, amended it so as to give park commissioners of the State power to say under what conditions automobiles can make use of parks. While the speed of 8 miles per hour may seem unreasonably low for a motor vehicle it is well to remember that there is yet much prejudice against the new method of locomotion, but it is only a question of time when the public will become more educated to the possibilities of motor vehicles. Then and not until then will we see a check given to at least some of the really absurd and unreasonable laws which are now springing up all over the country.

While the Doughty Bill may not give just all the automobilist would desire, it paves the way for a much more satisfactory condition of things in the future. Great credit must be accorded to the members of the A. C. A. and also of the N. A. A. M. for the good work they have done in this direction.

A visit to the works of the Mobile Company of America at Kingsland Point, N. Y., recently, saw that company hustling in order to keep up with orders. The number of men employed was about 300, and the President, John Brisben Walker, informed our representative that the superintendent had that day put on 100 more. The factory at that time was turning out about sixty vehicles per week, and the superintendent expressed the hope that before long this would be increased to ninety.

The Searchmont Motor Company are at work on a new factory, near Philadelphia, which will give them a much larger capacity. Their facilities for testing both motors and finished carriages are both unique and commendable. The motors are mounted on substantial frames sunk in masonry, where they are run for a long time—to thoroughly test and adjust them. The finished carriages—just ready for the purchaser—are mounted on rollers and run under exact road conditions to make the final adjustments of all parts, such as clutches and brakes. In this way the carriage ought to reach the owner ready for work in every particular.

Frame Construction

THREE is much discussion among designers as to the best method of frame construction. The advocates of a flexible frame have their followers, while the rigid frame and spring suspension men are not without supporters. In fact, there are fine carriages produced on both systems.

It has occurred to us that for heavy wagons locomotive construction might be used, and have a rigid frame with jaws for the bearings. In this plan the bearing boxes float up and down in the jaws (supported by springs, of course), while the frame, through the jaws, takes all the fore and aft strain. This permits using leaf springs, which are by far the best, and gives a rigid support for the motor and machinery, at the same time securing flexible and independent action of all four wheels.

Charles P. Turner, M. E., who has been connected with the International Correspondence Schools, Scranton, Pa., since 1895, has resigned to accept a position with the Garrett-Cromwell Engineering Company, Cleveland, Ohio. Prof. Turner's successor as principal of The School of Mechanical Engineering is Prof. A. B. Clemens.

Artistic Guide Posts

ABOUT forty designs have been received in the competition for more attractive forms of guideboards for use on Massachusetts highways. The competition closed April 1, and the designs submitted will be examined by the judges during the last week in April. The prizes of \$15 and \$10 will be awarded early in May, and the successful designs will be exhibited at the annual meeting of the Massachusetts State Federation of Women's Clubs, which will be held the latter part of May. It is through the Arts and Crafts Committee of this organization that the prizes are offered.

The above item, taken from the *Boston Transcript*, ought to be of interest to automobilists in view of the efforts now being made by the various clubs for much needed reform in the way of more satisfactory guide posts in various parts of the country.

The Automobile Index

Everything of permanent value published in the technical press of the world devoted to any branch of automobile industry will be found indexed in this department. Whenever it is possible a descriptive summary indicating the character and purpose of the leading articles of current automobile literature will be given, with the titles and dates of the publications.

Illustrated articles are designated by an asterisk (*).

Accumulator, The Jungner—

This accumulator is fully described by H. Delasalle in "La Locomotion Automobile," Paris, March 21, 1901.

*Accumulator, The National—

The cell consists of five positive and six negative plates, and is said to be one of the most satisfactory accumulators now on the market. "The Automotor Journal," London, March, 1901.

Accumulator Trials in France—

Official report of this competition held about one year ago. Taken from report issued by Automobile Club of France.

Air-cooled Motor Difficulties and How to Overcome Them—

T. Parker Hall, Jr. "Horseless Age," New York, March 27, 1901.

*Canada, The Automobile Industry and its Development in—

A brief history of what has been done in Canada since the introduction of the horseless carriage. "Canadian Electrical News," Toronto, March, 1901.

*Carbureter, The New De Dion—

A description of this carbureter which has proved very efficient. "Automobile Topics," New York, March 30, 1901.

*Carbureter, The Roubeau—

The operation of this device is very simple. With the aspiration of the motor the valve rises, the gasoline is projected against chambers and so vaporized. Two regulators are used so as to obtain the exact volume of air required. "The Autocar," London, April 6, 1901.

Cost of Operating a Steam Carriage—

Geo. E. Greenleaf. Gives detailed tabulated cost of running a steam vehicle for a season. "Automobile Magazine," New York, April, 1901.

*Cycles of an Explosive Engine—

Four diagrams showing the four operations which are carried on in the Otto cycle. "L'Avenir de L'Automobile et du Cycle," Paris, March, 1901.

*Daimler, A New 20 Horse-power—

This car has four water-jacketed cylinders. The machine carries sufficient gasoline to take it 200 miles on one filling. "The Autocar," London, March 16, 1901.

*Empress Car, The—

This is a light carriage. It has tonneau body and carries a De Dion $4\frac{1}{2}$ horse-power motor. "Motor News," Dublin, April, 1901.

Endurance Test, Details of the Long Island Automobile Club—

"Automobile Magazine," New York, April, 1901.

***Engine, The Dallenbach Two-Cycle—**

Description of this engine, the essential points of which are the closed air chamber below the cylinders with end projecting down into chamber, the trunk piston having a division wall and the peculiar connecting port.

***Explosions, Apparatus for Registering—**

Description of the Mathot device. By use of this apparatus one can follow the conditions of operation of any motor, whatever may be its rotary velocity. "Automobile Topics," New York, March 30, 1901.

France on an Automobile, Across—

J. E. Hutton. Interesting account of a trip taken in a 9 horse-power Napier. "Autocar," London, March 9, 1901.

***Gasoline Carriage, Working Drawings of a Light—**

Part 4 of a series of articles giving detailed dimension drawings of a small motor vehicle. "Horseless Age," New York, April 3, 1901.

***Gear for Motor Vehicles, Compensating—**

Its history and development. Sidney Russell. Part 2 of an interesting account of the early forms of the compensating gear. "Automobile Journal," London, March, 1901.

Horse vs. Electrical Equipment—

H. M. Underwood. A comparison of costs between horse and electrically operated delivery wagons. The tables cover every detail of expense. "Automobile Magazine," New York, April, 1901.

***Linjeler Voiture, The—**

This is a new French carriage, having the well known tonneau body, and fitted with a 6 horse-power Aster motor. "La Locomotion Automobile," Paris, March 21, 1901.

***Mechanic, My First Road Run Without a—**

Herman B. Baruch, M. D. A very entertaining story showing the waywardness of a particular motor car. "Automobile Magazine," New York, April, 1901.

***Motor Car, How to Manage a—**

This article is devoted to a set of very clear rules for the operation of a Daimler carriage. "Motor Car World," London, March, 1901.

Motor Vehicles, Heavy—

Abstract of a lecture delivered by that energetic advocate of self-propelled vehicles, E. Shrapnell Smith, before the Coventry Technical Institute Engineering Society. "The Autocar," London, April 6, 1901.

***Motoring, Lights and Shades of—**

By Mrs. Kennard. An interesting story charmingly written, regarding the thousand-mile trial of 1900. "Automobile Magazine," New York, April, 1901.

***Packard, A New—**

Description of a 1901 model of this wagon, which is built by the Ohio Automobile Company. "Automobile Magazine," New York, April, 1901.

***Panhard Car, The Miniature—**

This is an interesting machine. The motor shaft transmits its power through a friction clutch to the gear box, containing a train of tooth wheels, gearing with corresponding pinion on a parallel shaft below. "Motor Car Journal," March 30, 1901.

***Panhard Voiturette—**

Description of a new and popular type of car. Fitted with a 5 horse-power engine. Tanks for lubricating oil are mounted on the dashboard and within easy reach. "Motor News," Dublin, April, 1901.

***Petroleum Motor, An Australian—**

This motor uses 150° flash test heavy lighting oil. The charge is electrically fired. There is no visible exhaust either at the start or during operation. "The Autocar," London, March 23, 1901.

***Quadracycle, The Korte-Atkinson—**

This has a water-cooled motor, and also an improved system of firing which prevents lubricating oil from getting onto the platinum contacts. "Autocar," London, March 9, 1901.

***Racing Car, Building a—**

Interesting account of methods employed in the construction of a car which is intended to compete in the Gordon-Bennett cup race. "Motor Car Journal," London, April 6, 1901.

***Renaux Car, The—**

This is a light carriage with a two-cylinder Buchet motor developing 8 horse-power. Three forward speeds and one reverse are provided. "Motor Car Journal," London, April 6, 1901.

***Rooms of the New England Club, New—**

O. L. Stevens. Description of these new rooms, which are among the finest in the country. "Automobile Magazine," New York, April, 1901.

***Slip, Side—**

An interesting discussion of a subject which with the increase of speed is becoming more important. "Motor Car Journal," London, April 6, 1901.

***Sparkling Troubles, Their Causes and Remedies—**

There cannot be any doubt that much of the trouble attending the operation of automobiles is due to poor ignition. The article is replete with timely hints. "Horseless Age," New York, March 20, 1901.

***Steam Carriage, Blevney's New—**

An account of a new vehicle which possesses quite a number of new and

interesting features. "Automobile Magazine," New York, April, 1901.

***Truck, Steam—**

Description of a new two-ton wagon now being built by Ofeldt & Sons. "Horseless Age," New York, March 20, 1901.

***Wagon, A Motor Tip—**

This is a wagon of the Coulthard type, capable of carrying about five tons of coal, and can be tipped by one man. Hans Renold patent silent driving chains are used. "The Autocar," London, March 9, 1901.

***Wagon, The Coulthard Steam Tip—**

The tipping body is capable of taking a load of four or five tons and is so fitted as to be tipped by one man. "Motor Car Journal," London, March 16, 1901.

***Wellington Carriage—**

This is an interesting vehicle, in which friction gearing is used, thus obtaining transmission without toothed gearing. "The Autocar," London, March 9, 1901.

Wheels, Large vs. Small—

A letter from Chas. E. Duryea, in which he claims that wheels of large rather than small diameter are desirable for automobiles. "Automobile Magazine," New York, April, 1901.

***White Steam Carriage, The—**

This vehicle differs from other steam carriages by using a boiler of the flash type. "Horseless Age," New York, March 27, 1901.

